UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF INDIANA
EVANSVILLE DIVISION

AUTUMN CORDELLIONÉ, ALSO KNOWN AS JONATHAN RICHARDSON,	)	
Plaintiff,	)	
-v-	)	CAUSE NO. 3:23-CV-00135-RLY-CSW
COMMISSIONER, INDIANA DEPARTMENT OF CORRECTION, IN HER OFFICIAL CAPACITY,	)	
Defendant.	)	

The deposition upon oral examination of STEPHEN BARRETT LEVINE, MD, a witness produced by means of videoconference and sworn before me, Gretchen Fox, RPR, Notary Public in and for the County of Johnson, State of Indiana, taken on behalf of the Plaintiff remotely via Zoom videoconference on February 7, 2024, at 9:00 a.m., pursuant to all applicable rules.

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INDEX OF PREVIOUSLY MARKED EXHIBITS

STEPHEN BARRETT LEVINE, MD, having been first duly sworn to tell the truth, the whole truth, and nothing but the truth, testified as follows:

DIRECT EXAMINATION

BY MR. ROSE:

Q Good morning, Doctor. Can you just state your name for the record real quick.

A Stephen, with a p-h, Barrett Levine.

Q And I'm aware that you have had your deposition taken before, is that correct?

A Yes.

Q And approximately how many times?

A I think I would say ten.

Q And how recent was the most recent time you were deposed?

A A week ago. Two weeks ago.

Q Okay. The ten times you had your deposition taken, had they all concerned issues related to gender dysphoria or its treatment?

A For all practical purposes, yes.

Q Okay. I understand that you're a seasoned veteran at this point, but you understand that this is a formal asking and answering of questions under oath, correct?

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A Yes, I do.
Q And I'll ask at the outset. Can you hear me okay?
A Yes.
Q If at any time -- I have a tendency sometimes to let my voice drift a little bit, so anytime if you can't hear me, please just let me know, and I will speak up or repeat my question, is that okay?
A That's okay.
Q Okay. And I assume you have had your deposition taken remotely before as well?
A Yes.
Q All right. So the one thing I will point out, which I'm sure you're aware, is because the court reporter is writing down everything that we say, it's very important for you to wait until I finish asking my questions until you provide your answers. And I will do my best to extend the same courtesy to you, is that fair?
A That's fair. I'm -- that's fair.
Q Do you have any questions about the process?
A I don't think at this point.
Q Okay. I'm sure you have had depositions taken before that have lasted all or most of the day. It is very much my intention to get you out of here even before anyone has to start thinking seriously

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about a lunch break, but with that said, we'll just have to see how it goes. But if at any point you feel like you need a break to use the restroom, get a drink of water, stretch your legs, please just speak up, and I am positive we can make that happen, is that okay?
A That's okay. I -- the other day I mentioned to Mr. Carlisle that I would like a break every 90 minutes.
Q And attorneys are creatures of habit, so we usually break between 60 or 90 minutes just because we do, so that's perfectly fine. But if I start ignoring that, please just let me know if you need a break, that's 100 percent fine. Because I, as a human being do not trust other human beings, I'm going to be sharing my own exhibits on the screen with you today. You will notice that on certain exhibits I have highlighted portions of them. The only reason I do that is to direct my own eyesight so that I don't waste your time while I try to find the right portion. I understand that you're a little limited by what you can see when the share screen function is used, so if you need me to scroll up or down, please just let me know, and that's easy enough, okay?

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A Yes.
Q Okay. Where are you physically located right now? It looks like you might be in your home?
A I'm in my home.
Q And just city and state, where is your home located?
A Mayfield Heights, Ohio, which is a suburb of Cleveland.
Q Okay. And I do assume no one else is in the room with you right now?
A That's true. No one is in the room with me.
Q And do you have any documents in front of you?
A I have my CV, which is Exhibit 31, and Exhibit 32, my expert opinion report.
Q That answers my question. My next question -- I can tell -- I did tell Mr. Carlisle that it might make things go a little more expeditiously if you had hard copies of those in front of you. Even though I'm sharing my screen, please feel free to rely on the hard copies when we start talking about those. Other than those two documents, do you have any other documents in front of you?
A I have a pad with your name on it and a few things on the desk from my work here from -- but it's irrelevant to you, and I have a glass of water.

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Q I do as well. Do you have any documents open on your computer?
A No.
Q Okay. Okay. What did you do to prepare for your deposition today? Let me break that down. Did you speak with anyone in preparation for your deposition today?
A I spent almost two hours on Monday with Mr. Carlisle --
Q Okay.
A -- by video conference, and the night before I re-read my expert opinion report.
Q Other than that report, did you read anything in preparation for today's deposition?
A Well, I did read an article on surgery, on the complications of surgery, which is not in my expert opinion report.
Q Okay. Do you know who the author of that article is?
A It's Wouter B. Van der Sluis. It's S-l-u-i-s.
Q And S-l-u-i-s is the last name?
A Yeah.
Q And when did -- when was that article published?
A '23.
Q And this article was not cited in your expert

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report, is that correct?
A No. I think I found it after I submitted the report.
Q Okay. And it sounded like the article concerned complication rates for gender affirmation or confirmation surgery?
A It was entitled "Genital Gender Affirming Surgery for Transgender Women," and it was from a Netherlands group.
Q Okay.
A So I guess in answer to your question on the side here, I have my file, and it was contained in my file in this case.
Q Is that the only article you read in preparation for today's deposition?
A Well, it's the only article I read in the last two days.
Q That's a perfectly fair way of responding to that question. I assume you read it recently simply because it only recently came to your attention?
A No. I read it, I think, Sunday.
Q And did you read it Sunday for the first time?
A Yes.
Q Okay. Other than Mr. Carlisle, did you speak to anyone else in preparation for your deposition

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today?
A Well, my wife asked me what I was doing today, and I told her, and I mentioned Indiana and prisoner. Other than that, no.
Q I assume that was the extent of your conversation at least about the substance of your deposition with your wife?
A That's all I said, you know.
Q Okay. I also told my wife I had a deposition today. Okay. I'm going to pop up on the screen real quick just for the record what I have marked as Exhibit 31. Do you see that in front of you?
A I do.
Q Okay. And that is your curriculum vitae, right, your CV?
A Yeah. We pronounce it vitae, but maybe it's a different accent. I don't know.
Q And by "we," you mean people in the English speaking world who know how to pronounce things correctly?
A Well, that's too harsh, but...
Q And this document was tendered to us just a couple of weeks ago. I assume it's your most recent version of your CV?
A It's the most recent version, but I have

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subsequently submitted an article for publication which is probably not on -- which is not on this, but that's the only difference.
Q Okay. And has that article been accepted for publication yet?
A No, no. It's just been submitted. It's probably months away from acceptance or rejection.
Q Okay. And do you know what the title of that article is?
A Well, I better know. It's called "A Comprehensive Psychiatric Evaluation for Transgender-identified Minors."
Q Okay. And it sounds like it's limited in substance to the treatment of minors?
A No. It's about the evaluation of minors in preparation for treatment, but, of course, the implications of -- the implications would be that everyone who is transgender-identified that is seeking some kind of medical assistance ought to have a comprehensive evaluation, but you're right that, you know, it denotes that age group.
Q Okay. You are a licensed psychiatrist, is that correct?
A Correct.
Q And I assume you're licensed by the state of Ohio?

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A Yes.
Q Are you licensed by any other states?
A No.
Q All right. Do you consider yourself to have a specialty within the realm of psychiatry?
A Yes.
Q And what is that specialty?
A Human sexual concerns, so that involves love relationships that manifest with sexual life and sexual problems, sexual dysfunction, marital relationships, sexual identity issues. So I have been a specialist in that since my residency ended in 1973. I was hired to develop a curriculum on human sexuality for medical students and to develop clinical care services in our department of psychiatry. So since July of '73, that's been my major focus, although I am a general psychiatrist, adult psychiatrist first and foremost, and that's my subspecialty, and I have always considered myself an educator.
Q Okay. And in your specialty of human sexual concerns, I assume that relates to both cisgender and transgender persons?
A Yes.
Q And do you have any -- forgive me. I simply don't

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know how it works -- but do you have any board certifications?
A Yes. I'm board certified in adult psychiatry and neurology.
Q All right.
A That's the name of the board, psychiatry and neurology. You shouldn't infer from that that I'm a specialist in neurology.
Q Okay. And that was going to be my next question, but adult psychiatry and neurology is one board certification, correct?
A Yes.
Q Okay. Okay. My understanding then is that you began your psychiatric residency in 1970 and finished it, I think you mentioned, in '73, is that correct?
A Correct.
Q And then in 1974, you founded the gender Identity Clinic at Case Western University in Cleveland?
A You know, I'm not sure whether it was late '73 or '74. Certainly by '74 it was up in operation. It may have been in November.
Q Okay.
A Yeah.
Q If this case hinges on the difference between 1973

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and 1974, I'm quitting show business, okay?
A Yeah.
Q Was that the clinic's formal name, The Gender Identity Clinic?
A No. It was called the Case Western Reserve Gender Identity Clinic, and that was because it was a compilation of therapists or psychiatrists from two of the universities' major teaching hospitals so --
Q Okay. And please forgive me if I'm wrong. I thought I read somewhere it being mentioned as the University Hospital of Cleveland Sexual Dysfunction Clinic. Do you know what that is, or is that the same thing?
A No, it's not the same thing.
Q Okay.
A In the process of the early years of my work, I established a number of clinics having to do with sexual topics. There was a sexual dysfunction clinic for problems, like in women, inability to have an orgasm and decreased sexual desire or absence of sexual desire or pain on penetration or the inability to tolerate intercourse, and for men, to do care of problems like premature ejaculation and what in those days was called impotence or inability to maintain an erection for sexual

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purposes.
And then we established a separate clinic for paraphilias which are -- just for paraphilias, and then we established a clinic called Marital Therapy Clinic. And along the way, we established the liaison work in the Department of Urology separate from the sexual dysfunction clinic because in urology -- but basically that was a men's sexual health issue, and then there was a Gender Identity Clinic, and a little bit later, a lot later, we established a clinic called The Program for Professionals where we started dealing with doctors and teachers and nurses who had crossed sexual boundaries in the context of their professional life.
So in the process of developing both education and clinical services, we realized that it's a very broad topic how human sexual problems fall into categories, and so we sort of commandeered various people from the Department of Psychiatry and from the community to form -- to meet regularly to think about how best to conceptualize and treat these various sexual forms of suffering or problems.
Q Okay. Speaking specifically about The Gender Identity Clinic, my understanding is that it was

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formally associated with Case Western from 1973 or '74 until 1993, is that right?
A Yes.
Q And in '93, it disassociated from Case Western and changed its name?
A Yes.
Q Okay. What did it change its name to?
A Well, just -- I think just The Gender Identity Clinic because we just dropped the Case Western Reserve.
Q Okay. And then has it since been renamed?
A Yes. It's now called The Gender Diversity Clinic.
Q And when did that change happen?
A Probably close to 2017, plus or minus. Either 2017 or 2018, something like that.
Q Okay. And is it currently in operation under the name of Gender Diversity Clinic?
A Yes.
Q And do you still work there?
A I do. I am the head of that clinic.
Q Okay. And my understanding is that you also maintain a separate private practice right now?
A Well, I'm in private practice, and I used to own, with colleagues from 1993 on, a private practice. And we maintain -- our work, our focus -- my two

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colleagues were also experienced specialists in various sexual problems. And in 2017, I sold my practice to two of my employees, and so they have made a number of changes, and one of the changes was in keeping with what was going on in the culture, we changed our name from The Gender Identity Clinic to Gender Diversity Clinic. But both of my original partners have retired, and I'm left as an employee of DeBalzo Elgudin Levine & Risen, and I run the gender clinic, you know. It's -- I run the gender clinic.

Q And before we go forward, I will do this for the court reporter, but DeBalzo is D-e-b-a-l-z-o?

A Yeah, and the B is capital.

Q Okay. And E-l-g-u-d-i-n?

A Yes.

Q And Risen is R-i-s-e-n?

A Yes.

Q Okay. Do you run The Gender Diversity Clinic through that private practice, DeBalzo and others?

A Yes. It's an integral part of it.

Q Okay. Has that been the case since 1993 you have run the clinic through your private practice even though there might have been different names to the practice?

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A Yes.

Q Okay. And has the focus -- I understand the sciences have evolved since 1973 or '4, but has the focus of the clinic changed between its inception and today?

A Oh, yes. In the '70s, none of us -- none of us understood any of this. This was a new phenomenon to psychiatry. For example, I never heard of transsexualism until my senior year, until the spring or March of 1973 when there was a person admitted to urology for -- under the word -- under the label chronic prostatitis, and it was discovered by the nursing staff that the head of urology was planning to remove his genitals and create female genitals. And that created an alarm in the medical administration, and the patient was discharged without surgery, and the head of the Department of Urology was slapped on the wrist for this.

But that was the first time I heard about this, and this particular patient had just visited the urologist who agreed to do the surgery, and there was no psychiatric screening whatsoever back then. And that got us thinking that psychiatry needed to play a role in this phenomenon that we

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didn't know anything about, and on June 30 of 1973, I was a senior resident of psychiatry. And on the next day, July 1, 1973, people began referring to me as an expert in human sexuality. You know, you have to take these things with a grain of salt. But what happened in about 13 days is one of my supervisors sent me a patient that he had seen once saying that you should see the expert down at Case Western Reserve, Dr. Levine. And this was a man named Rutherford who told me the story that he was sitting underneath his oak tree with a gun in his mouth, and he decided he had a choice in life, either to pull the trigger or to become a woman. And so by whatever the date was, July, I had seen my first transgender patient. And, of course, I had never seen anybody like that, and so I went to the chairman of my department who was my mentor, and I said, what should I do? And he said he didn't know. He had never seen this before. And so that was the -- that really was the beginning of the Case Western Reserve Gender Identity Clinic. We decided we needed to study this phenomenon. Of course, we didn't know what to do with these patients.

And we began realizing that since Christine

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Jorgensen's' fame in 1953, '52 and '53, there had been a trickle of people who -- they were almost all men almost, all middle aged men who had this interest -- and so we started this clinic with five or six people from two hospitals. And I'm telling you, for the next 18 years, we had a steady stream of people, mostly men, mostly in their 20s to 60s, who began telling us trans stories. And many of us -- my entire clinic then joined what was called in those days the Harry Benjamin International Gender Dysphoria Association, and we started going to meetings every two years. There was a group of us around the world, actually. I mean Europeans and North Americans who also didn't know what to do with these people, but they included a bunch of surgeons, and it was very clear that many of these men said that they wanted surgery, and many of the surgeons started doing the surgery. So I was part of this international process of trying to figure out what's going on here, and I guess the rest is history.

Q Did the -- just for the record -- and I'm not going to repeat the entire name, but the Harry Benjamin organization, that's the organization that's currently known as WPATH?

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A Yes. In 2007 it changed its name, and if you want me to repeat it, it's the Harry Benjamin International Gender Dysphoria Association.
Q Is it fair to say that from the time that the clinic opened in the '70s until today its focus has been exclusively on persons who either have been diagnosed with what is now known as gender dysphoria or otherwise experiencing issues related to their gender identity?
A Yes, it's fair to say that that was the primary focus. In studying these folks, while all of them had at least entertained an aspiration to live in the opposite gender role, we got to know many of these people, and they had many, many problems. And so the focus -- you know, the focus always began with the gender issue, but in the course of our evaluation, you know, some of them were -- a few of them were psychotic, and many of them were chronically depressed. We didn't have the word for autism in those days, but today, in retrospect, many of them were very -- they had neurodevelopmental problems. And so it was all about the focus about gender identity. That's why they came here because there was a clinic. There was one clinic in Cleveland devoted to these

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issues, and people from mostly all over the state came to us primarily in the three-county area around us but sometimes from more distance.
Q Okay. I'm sorry. Since its inception, has the clinic ever served minors?
A Oh, yes, we occasionally -- somewhere in the early '80s, I remember a parent came to me as a private practitioner because they had a four-year-old, cross-gender-identified child, and we did see an occasional minor. But I would say 85 percent of the people we saw during those 18 years were adults, and I remember I presented a paper on, I think, about 80 people, and they were all adults.
Q And why are you breaking it down into the first, I guess, 18 years before it become -- before it switched away from being known as The Gender Identity Clinic?
A Because in the first 18 years, I was in a university setting where we had medical students, psychiatric residents, and fellows in human sexuality. And I also had sort of collected or gravitated towards our work a number of people who wanted -- were interested -- who were interested for their careers, and that gave us an opportunity to collect the systematic data on these things, and

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it enabled us to present some data in presentations.
I had this wonderful colleague who was obsessive-compulsive enough to want to keep track of things, and so that ended in 1992, 1993, when he left the university, so that's why I make the distinction.
Q And that was going to be my next question. When you're referring to the first 18 years, you're referring to the period of time that the clinic was formally associated with Case Western?
A Yes.
Q Okay. Okay. During these first 18 years then, what type of services were offered by the clinic?
A Well, everyone had an evaluation, and that evaluation typically consisted with a -- sort of three to six hours with an individual person and psychological testing.
Q I'm sorry, Doctor. I don't mean to cut you off. Let me ask a real quick clarification on that. When you say "evaluation," you mean a psychiatric evaluation?
A Yes.
Q Okay.
A A mental health professional who belonged to our

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clinic would be assigned to a patient, and the patient -- that person would meet with the person between three and six hours and perform -- and give them psychological tests, the MMPI and the MCMI. I don't need to tell you what they stand for. And then they would present that case to our entire clinic, and usually I would say almost always that person was interviewed by one of the senior members by someone other than the clinician, and then we would come together and agree or disagree with the diagnosis and then contemplate what should be done next. And we would try to make that decision as a group, so sometimes we would -- we would be able to make the decision during the one-hour period where there was a presentation and interview and then a discussion, and sometimes we had to wait until the next meeting to make a decision because we ran out of time.
Q Okay. I assume that when you were agreeing on a diagnosis, sometimes patients were diagnosed by clinic staff as having what would now be known as gender dysphoria?
A Yes. In those days, we called it transsexualism.
Q Sure. And --
A And then we called it gender identity disorder

after a while.
Q Sure. And I don't want either of us to get bogged down in semantics. Is it okay with you if I use the current terms, and we can agree that includes predecessor terms?
A I'm sorry. There was -- one phrase was garbled. You said -- did you say if we just agree to use gender dysphoria?
Q Is it okay if we just agree to use the current --
A Oh, yes.
Q -- terminology?
A Yes. The current ideology -- the current nomenclature seems to be synonymous. It's not really, but it seems to be synonymous, gender dysphoria or gender incongruence.
Q And during these first 18 years, approximately how many patients did the clinic diagnose with gender dysphoria?
A I'm going to smile and say 315.
Q And I knew we're not going to have an exact number. Is it fair to say it was in the hundreds?
A No. I'm serious. It was 315 or 318, something like that. I mean, we kept track.
Q I'm sorry. I thought you were teasing me.
A No. No. No. No. I'm sorry I misled you. As I

say, we had this wonderful guy with a little obsessive-compulsive capacities, and he wanted to keep track. And we -- that number was I think when -- as a result -- I'm told that number represents 1992.
Q It represents 1973 through 1992?
A Yeah. And I'm sure that's not the complete number of patients, but those were the number of records that we had.
Q Okay. And of those 300-odd-some patients that the clinic diagnosed with what is now known as gender dysphoria, what type of services did the clinic offer to those people?
A Well, we offered continuing psychotherapy. That is we -- so we offered continuing psychotherapy, and we offered continuing relationships while they did other things like we would send a letter to an endocrinologist. We had actually an endocrinologist on our committee, and he didn't attend the meetings regularly. We also had a surgeon who attended occasional meetings but -- so the answer to your question was that we sometimes would write a letter based upon our psychiatric evaluation. I think I forgot to tell you that as a result of the psychiatric evaluation, there was a

report written, and that's why we had 318 charts because I had 318 reports. So we would use those reports and use a cover letter to say the patient wanted surgery -- I'm sorry -- wanted hormones, and we see no major reason not to do this. We actually never recommended hormones, and we never recommended surgery. But we felt that the patient had met our requirements, and if they wanted to take the risk of these unknown treatments, it was their prerogative to do that.
Q So if the patient wanted hormones and you did not see a reason not to have -- for them not to have hormones -- it sounded like you wrote a letter explaining that to an endocrinologist?
A Yes. But either we would incorporate the original evaluation report into that letter, or we would send a letter plus the original evaluation. We felt very strongly that the doctor who was going to take responsibility to give hormones needed to understand the psychiatric background and the psychiatric challenges that this person represented, that this person had. See, none of us knew what the outcomes of these cases were.
Q Sure.
A And there was really very few published studies

that amounted to, what I say, good science, and we were just part of this international community that thought that maybe this experiment would help these people.
Q Okay. We have been talking, Doctor, about hormones. I assume we agree that we're talking about what I would refer to as gender-affirming or gender-confirming hormones?
A I don't believe we used those terms in those days, so most of these were men, so we were talking about estrogens.
Q And then for -- you mentioned also the clinic would occasionally write letters to surgeons?
A Yes. Yes.
Q And I assume that these letters said something similar along the lines of this patient diagnosed with gender dysphoria has expressed a desire for surgery, and we see no reason why that should not happen?
A No, not exactly the latter. We would tell them how long we have known the person. We would give them a description of the person's life and psychiatric challenges or interpersonal challenges, their psychiatric diagnoses. And we would say that we asked the person to participate with us over a

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period of time, and they have done this, and they persisted. They persisted in the wish to see a surgeon and to contemplate having surgery. And so, you know, you could decide what you want to do, Doctor.
Q Is it fair to say that you would not -- or you -- that the clinic would not write that letter either to the endocrinologist for hormones or to the surgeon for surgery if you saw a reason that that person should be disqualified from receiving that particular treatment?
A Yes. We saw people that we thought it would be grossly inappropriate and not in their best interest because of associated psychopathology to have surgery, right.
Q And for those persons, you would not write the letter; you would not refer them?
A You see, we would tell them in a personal interview why we weren't going to do that.
Q Okay. Of the 315 or 318 gender dysphoric patients during this 18-year period, about how many of those persons began receiving gender-affirming hormones?
A I have to think about that.
Q That's fine.
A I imagine 40 to 50 percent. I want you to know I'm

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guessing.
Q Sure. Sure. And approximations are perfectly fine with me. I understand that, A, it's a lot people, and, B, it was a long time ago. Of these 315 or 318 patients, approximately how many received gender-affirming genital surgery?
A Much fewer. Probably a dozen.
Q Had any received any gender-affirming surgeries other than genital surgery? Excuse me. Let me rephrase that. Strike that. Had any of them received gender-affirming surgeries but had not received genital surgery?
A If I can interpret your question.
Q By all means.
A And rephrase it. Did we remove -- did we send any biologic females who were cross-gender identified to have mastectomies? And because the vast majority of the people were males, that didn't come up very often in the '70s and the '80s, but there must have been an occasional person who decided to remove her breasts or, shall we say at this point, his breasts. Is that the question you were really asking?
Q It's close enough. How about that? I'll move on. I found an article from you that you wrote that was

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published in 1981 called "Expressive psychotherapy with gender dysphoric patients." Are you familiar with the article I'm referring to?
A That's the one with Dr. Lothstein as a coauthor?
Q I apologize. I don't remember. It's the one that I think details the clinic's experience with the first 50 patients it saw.
A Well, I didn't remember that, but you have read it since I have.
Q And if you don't remember it, I'm not going --
A In the early '80s, Dr. Lothstein and I wrote two articles, I think, about psychotherapy with these patients, yeah.
Q Okay. And the only thing I was going to ask you is that in the article, you say that of the 50 gender dysphoric patients that have been seen at the clinic at the time, 10 percent have received both gender affirming surgery and psychotherapy.
A Okay. I didn't remember that.
Q Okay. Then I will not ask you about it.
A Okay.
Q After -- other than the change in science to the focus -- I'm sorry. Let me strike the question. Focusing now on the period of time after the clinic ceased being formally associated with Case Western

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to the present time, I assume that the clinic still provides and has provided throughout the time the psychological evaluation or psychiatric evaluation for patients?
A Yeah. We are mental health professionals, and so the idea of meeting a person and sending them to hormones without a psychiatric evaluation without an investigation of what is this about, it's just incompatible with how we think.
Q Since the clinic disaffiliated from Case Western, approximately how many patients has the clinic diagnosed with gender dysphoria or its predecessor terms?
A Well, I haven't kept track of that, but I could say that it was -- the rate of referrals was much less from 1993 even to the present. And one of the reasons for that is that in the early -- in the 18 years that we were operationally within Case Western Reserve, we were the only clinic in town, and then in the '90s, other clinics, Metropolitan Health Clinic, had what was a spinoff clinic to deal with sexual minorities, mostly lesbians and gay people, and they began getting interested in the treatment of trans-identified people. And then the Cleveland Clinic got interested in this, and

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then the university hospitals got interested in this. And so in the '90s, we went from being the only place in town and known as basically a conservative, let's investigate this, let's think about this together, to these other clinics that believed in the best way to treat these people was to affirm them.

And so we began sometimes seeing people who had come from these clinics who on the first visit would get a diagnosis and a recommendation for hormones, and so we basically got shut out of the game, so to speak, of taking care of these people. Not only that, some of the people we trained went into private practice, and they started taking care of gender people. So instead of having, you know, a new patient a week, so to speak, we had an occasional adult patient come to see us and more and more during the '90s and the -- since that time we began seeing people who had a lot more hesitance about this, and they wanted to talk about this. For example, someone came to see me and had been --

Q I'm so sorry, Doctor. Let me cut you off because I really don't want to take your entire day up. The question I had asked you was since 1993, approximately how many patients the clinic had

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diagnosed with gender dysphoria, and it sounds to me like you do not know.

A Since -- so the -- we're talking about 31 years.

Q Sure. And a rough approximation is fine with me. Are we talking about a number in the hundreds? In the dozens? Thousands?

A I think we're probably talking about 50, 60.

Q Okay. And of those 50 or 60 patients, I assume there had been occasions where you have written referrals for either hormones or surgery?

A There have been rare occasions that I have done that, yes.

Q And of those 50 or 60 persons, approximately how many did the clinic write a referral for a patient to receive hormone therapy?

A I would probably say a handful.

Q Okay. And approximately how many of these 50 or 60 people did the clinic write a referral for surgery?

A Less.

Q Just a couple?

A Well, I have written letters for surgery for people who chose not to have it, and so I think that's a very important thing to get into the record here. One of my current patients I wrote a letter in support for orchiectomy, and the patient decided

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not to have it. I can't remember the year, but I know we approved someone for a vaginoplasty, and he also decided not to have it and then de-transitioned. So most -- see, in recent years, most of the patients that I have seen have been minors, adolescents. You also probably know that I have been involved with the Massachusetts Department of Corrections for 17 years, and so most of my experience with adults in recent years have been through the prison system.

Q Let me just ask you this very broadly, and if you need to rephrase the question, please feel free to do so. But over the last decade or so, approximately how many gender dysphoric patients have you had at any one time?

A What was the last three words?

Q At any one time.

A Oh, at any one time. I would say, like, four. That's not including the people that I supervise. So if you include that, the numbers get higher, much higher.

Q For patients who came into the clinic either with a diagnosis of gender dysphoria or the clinic diagnosed with gender dysphoria who expressed an interest in obtaining one or more gender-affirming

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surgeries, did the clinic itself perform an evaluation for the appropriateness of those surgeries?

A Your question assumes that we have the capacity to discern what is appropriate and what is inappropriate when it comes to surgery. I actually think that we don't have a crystal ball about who is going to do well and who is not going to do well, and I actually do not have enough narcissism to think that I know who is a good candidate for surgery and who is a poor candidate for surgery because something that I already mentioned to you, over the years -- and I think we're talking 50 now -- over the years, I have seen people who present themselves in a certain way and then don't -- then -- and they present themselves in, what I would say, a way that they want me to reach a certain conclusion. And then, for example, the person that I wrote a letter for vaginoplasty who then de-transitioned, you know --

Q I'm so sorry, Doctor. I think the problem might have been how I asked the question, so let me find a different way to ask it. If a patient came to your clinic from Indiana with a preexisting diagnosis of gender dysphoria and walked through

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your clinic doors and said, hey, I just moved to town, while I was in Indiana, I did not have a chance to have gender-affirming surgery but I'm very interested in doing that now that I'm here, what steps will you take before deciding whether or not to write a letter to a surgeon on that patient's behalf?

A I would say, No. 1, I would do a comprehensive multiple-hour evaluation over time. I would tell the person right off I can't write this, you know, until completed, until I get to know you. And if he had involvement in medical care for this in Indiana, I would want to get the medical records from Indiana, and he would get to know me through my questions, and I would get to know him through his answers to my questions. And I would want to know why he moved from Indiana and why, you know -- what kind of care he got. You see, it's the patient's decision to have sex reassignment surgery, or, you know, depending on -- maybe you call it gender-confirming surgery now -- it's the patient's decision. I review the pluses and minuses and what the person knows about complication rates. I also want to know what benefits he expects from this, and I want him to

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understand what science knows about the benefits and the harms, and he needs to understand in order to have informed consent the limited knowledge that we have about the long-term outcome of this kind of major thing. Obviously, this is irreversible, and so we have to have a good enough relationship that we can talk over time and get to know one another. It is not, at the end of this, Mr. Rose, that I'm going to say, I'm enthusiastically endorsing the need for -- the medical need for gender-confirming surgery. I'm saying I have worked with this patient for 12 hours. I reviewed his history, and here's the relevant history. The patient has chronic depression. The patient has a history of sex crimes, whatever, and the patient thinks that this is the best solution for his current suffering, and so he's asking me to write a letter for you, and this is my letter of introduction.

You see, I want the surgeon to take ethical responsibility for this. I want the endocrinologist to take ethical responsibility for this. I do not know what is going to come of these operations. See, I don't want him to think that, oh, the doctor said it's okay, so it's ethically okay. I don't think I'm smart enough to do that.

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This is an ethically -- because it's a scientifically limited area, this is an ethically fraught area, and I have always, since the beginning, been uncertain about this. Now I need to give you one more background.

Q Doctor, I'm sorry. We really are going to be here for a week if you keep -- if you keep answering questions that I have not asked, so I just want to try a little harder to redirect you to these questions, if you don't mind.

MR. CARLISLE: Let's let the witness finish his thought, please.

MR. ROSE: We're not going to do that, Alex. If there's a question on the table, I have a right to get an answer to my question. He's not allowed to --

A Mr. Rose, I was, in fact, answering your question.

Q Doctor, the question I had asked you was what you do after seeing the patient before deciding whether or not to write a letter to a surgeon or not to do so. And it sounded like your process is to get to know that patient over time. Is that a fair statement?

A That's fair.

Q And I assume by over time we're talking about a

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period of months and several meetings?

A Well, it doesn't have to be months, but it certainly is going to be several meetings, probably, you know, at least four to six hours.

Q And I assume in your clinic practice there were -- there are no circumstances in which you would decide whether to refer a patient to a surgeon or not based on only review of medical records?

A Well, in my practice, I have a person in my office, so the medical records may be part of the review, but in my practice, I'm actually face to face with a person.

Q And so some of your clinical patients have actually obtained confirming surgery, correct?

A What was the verb in that sentence?

Q Have actually obtained confirming surgery?

A Oh, have obtained. Yes.

Q All right. Doctor, how did you come to be involved in this litigation?

A I got a phone call from the Attorney General's Office, from Mr. Carlisle.

Q The State reached out to you, not the other way around?

A Not the other way around.

Q And my understanding from your report is that you

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are charging $500 an hour for your services in this case?
A I am.
Q Do you have an estimate as to the number of hours you have expended on the case thus far?
A 26.
Q About what percentage of your current annual income is derived from your work as an expert witness?
A That is varied from year to year. My work as an expert within this area is only, I think, three years old, so four years ago it was zero. Last year was shocking. I think prior to pretax, it probably was 40 to 50 percent.
Q Okay. I still have your CV up on the screen, correct?
A You do.
Q Okay. I'm going to flip down to page 5. Do you see under, I guess, section 9D there where it's titled expert witness appearances and deposition or trial?
A Uh-huh.
Q Yes?
A Yes. I'm sorry.
Q That's okay. And these are five lawsuits in which you have appeared as an expert witness in either

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depositions or trial?
A Yes.
Q Is this a complete list of the lawsuits in which you have testified as an expert witness?
A No. No. I think you have to go down to 10.
Q And I think it's actually on the next page. I guess my next question to you is how did you decide which five cases to list here?
A This CV is an evolving document that -- over the course of 50 years -- and the first involvement in this area was D1. And then I got to work for the Department of Corrections, and then that generated you know, the Bautista case and the Sunia case.
Q Let me ask a quick question this way, Doctor. You had referred to having to go down to 10, but I'll scroll down to pages 6 and 7, where section 11 is titled expert witness reports, deposition, or testimony.
A Yeah.
Q Do you think that --
A Yeah.
Q And I guess my question was, is there a distinction between the five cases that you have listed on page 5 and the ones down --
A No. I think if I had the time and the inclination

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to fix my CV, I would change these sections because they're not so distinct.
Q That's perfectly fair. And of the five cases in section 9D, my understanding is that all five of those concerned gender-related care?
A Yes.
Q And the first four of these listed here concerns specifically care by persons who were incarcerated -- or persons who were incarcerated?
A The first four.
Q And the Kadel case did not, is that correct?
A Yes.
Q Okay. Okay. Then when we add in the cases that you have identified in section 11 which spans pages 6 to 7 -- and I will just tell you there are 29 different cases listed here -- is this intended to be a complete list of the cases where you have appeared as an expert witness?
A Well, those -- if you go to the one that starts with double letters, like 26, 27, 28, A and B, I just -- whatever new case comes up, I just add it to that section. I have been -- I haven't even looked at the first section that you -- so the new cases are going to be DD, for example.
Q Okay. So the answer is yes, this is intended to be

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a complete list of the cases?
A It's in -- yes. The answer is yes and yes. It's intended -- whether it's actually a complete list, whether I forgot something, it's possible.
Q I have highlighted the first two cases here, the Charlene Fuller litigation and the Norsworthy case.
A My understanding is that both of these cases concerned the provision of gender-affirming care to prisoners. Well, actually, Charlene Paige Fuller, who is now deceased by the way, I think it wasn't about -- it was something about breast forms.
Q Okay.
A It wasn't about hormones or surgery. Ms. Fuller had --
Q That's fine. I just wanted to make sure I understand.
A You're not asking me about the details. I'm sorry. I misunderstood.
Q That's okay. The Norsworthy case, though, was a patient that was seeking gender-affirming surgery?
A Yes, that was -- yes.
Q Okay. And the patient in that case was a prisoner, correct?
A A California prisoner.
Q Other than those two cases on this list -- and I

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can scroll down slowly if you want -- but are there other cases on this list that concern specifically the provision of gender-affirming care to prisoners?
A Yes. Scroll down, please.
Q I'm trying to go slowly so you can see everything.
A Let me see what N is. Oh, no. Okay. Dylan Brandt. I think Dylan Brandt was a teenager that would, you know -- the Dylan Brandt case was about a law. It wasn't about a prisoner. Your question is about a prisoner, right?
Q That's correct.
A Yeah. Okay. Let me see. I think you're probably right.
Q Okay. My understanding is that you also submitted an expert report in a Kentucky case called Clark versus Quiros, Q-u-i-r-o-s. Do you recall that?
A Is that not on here? Yes. I think -- I do recall.
Q Okay. And your deposition was taken in that case?
A Yes.
Q And do you recall whether your deposition was taken in the last four years?
A Probably was in the last four years, yes.
Q And if I tell you that you were deposed on March 9, 2022, does that sound about right?

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A Well, that's within the last four years. The month and date mean nothing to me now.
Q Sure. And that case specifically concerned a prisoner with gender dysphoria who was challenging the refusal of the correctional department to provide them with gender-affirming surgery?
A Yes.
Q Is there a reason you did not identify that case here?
A No.
Q Okay. Are there any other cases that you can recall where you served as an expert in a case brought by a prisoner?
A So is there -- there was a Nebraska case. I don't know. Is that listed somewhere in there? I think Florida had a case, and I don't think I ever -- I didn't have a deposition, and I didn't write an expert opinion report, but I was helping the -- someone defending the case. I was sort of getting her and her team up to speed on the literature of this, but I don't think I -- that was all I did, and so I didn't list that, I think, and --
Q That's fine.
A And I -- if there's nothing there on Nebraska, there should have been, and so that involved a

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prisoner. And that was in the last four years. That was probably two and a half years ago, three years ago.
Q Was your deposition taken in that case?
A No.
Q Did you testify at a hearing in that case?
A No. I wrote an expert opinion report.
Q Okay. And do you recall the prisoner's name?
A No. The prisoners' names often aren't given, but I don't recall if it was.
Q Okay. At the bottom of page 6, you identify a case called Tingley versus Washington State. Do you see that?
A Yes.
Q And my understanding is that that case arose as a challenge to a state law banning certain therapists or mental health professionals from performing so-called conversion therapy on minors. Is that your understanding?
A I'm not sure it was on minors.
Q But it concerned a state law banning conversion therapy?
A I think Tingley was a psychologist who objected to not being able to talk about gender identity -- or gender identity with patients who requested it, and

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that's my memory of it. I don't remember it being a minor.
Q Okay. Are you currently a member of any professional organizations or associations?
A I'm a member of the International Academy of Sex Research, the American Psychiatric Association. I just sort of let my -- I have been a long-term member of Society for Sex Therapy and Research, and I guess I'm a member of Gender Exploratory Therapy because I'm an author of one of their papers, one of their position papers, so -- but it's not like -- like, I don't pay dues to that.
Q Sure. And I'm sorry for asking this. This is just one of those questions that attorneys feel bound to ask, but have you ever had any disciplinary action taken against you by any professional licensing authority?
A No.
Q Have you ever been adjudicated by either an administrative or a judicial body to have committed professional malpractice?
A Say that again.
Q Have you ever been adjudicated by either a court or some sort of administrative body to have committed professional malpractice?

A Oh, when I was the owner of my practice, I had a therapist who had given an enormous amount of medication to a patient, and then that patient left my practice and then had a -- I'm sorry. Then the therapist left my practice, and she had a psychiatric decompensation, and the patient did not have access to the enormous amounts of medicine that the doctor had given. And she eventually had a seizure and got hospitalized, and she sued the doctor, and because I was the owner of the practice, I was sued as -- my partners and I were sued, and so we were found against for vicarious liability, and our insurance company paid a fine or paid some money based on that case.
Q Okay.
A But other than that, that is the only time that there was a malpractice case against me.
Q Okay. And about how long ago was that?
A 1999.
Q Okay. And it's my understanding that you have been sued a couple of times by prisoners who were seeking -- by Massachusetts prisoners who were seeking gender-affirming care, is that correct?
A Oh, I was, like, I think, one time. I was the eighth or ninth person listed on a lawsuit, yes.

Q Okay. Trust me when I say that our office understands that prisoners can be a litigious bunch. Other than these instances and the one you mentioned, have you ever been sued for malpractice before?
A In my private practice, I have never other than the one, that vicarious liability. For work that I have done, I have never been sued.
Q Okay. Okay. It is my understanding that you began consulting for the Massachusetts Department of Correction in or around 2007, is that correct?
A Yes.
Q And it's my understanding that what happened is that you were initially appointed by a court to evaluate a prisoner seeking gender-affirming care, and on the basis of the relationships you developed in that case, the Massacusetts Department of Correction made your role a more permanent consultancy. Is that a fair summary?
A It's about 90 percent accurate, but let me --
Q Sure.
A Let me give it to you more accurately. The judge, the federal judge, asked me to be his witness in a case in 2006, and so I did that. After that case, after my six hours on the stand -- I don't

remember -- several months later the Massachusetts prison -- the DOC in Massachusetts reached out to me, and they had 12 prisoners in various institutions, and they sent -- they asked for a consultant for those 12 prisoners with transgender identities, and the consultations on the 12 prisoners came back with the same 12 recommendations, which is they should immediately have sex reassignment surgery. And so the DOC was outraged at this, and they hired me to come to Massachusetts and interview those prisoners and give them an individualized treatment plan for 12 people. In the process of doing that, I suggested to them that they needed to have a gender identity clinic. They needed to take care of these prisoners, not on a one-time consultation basis, but they needed to provide evaluation and therapy for their trans prisoners.
And so they agreed to do that. And in order to do that, they invited me to, on my suggestion, that I gave a six-hour workshop to the mental health faculty of the staff of the prisoner system. And so one day all these people came into the audience, and I spent six hours talking to them about what was known about this phenomenon, and

they had volunteers from each of their male prisons to be in the new Gender Identity Clinic there. And I was appointed the consultant to that clinic, and in the course of years there -- and that would be going on the 17th or 18th year -- I have sort of educated not only their staff, but I have educated their psychiatric directors, so there have been three psychiatrists, three people, who directed those clinics. And over the years, I have played a role in educating them and overseeing their work, and my oversight is very minor, generally, because I go to a -- I spend two hours once a month during their meetings and comment on their cases and try to get people up to speed in terms of understanding the complexity of the mental lives of prisoners.
Q Okay.
A That's my role.
Q You still serve in that capacity as a consultant to the Massachusetts DOC?
A Yes, I do.
Q Okay. It sounded like before your involvement these 12 prisoners had all been approved for gender-affirming surgeries?
A Oh, no, no, no, no, no. Quite the opposite. They were recommended for sex reassignment surgery by

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people who didn't work in the prison, and that horrified the prison system.
Q Okay. So they had been recommended by outside providors to receive gender-affirming surgery?
A Yes. On the basis of one-to-two-hour visits.
Q Okay. And did the Massachusetts DOC ask for you to reevaluate these patients?
A That's exactly what they asked me to do, yeah.
Q Did they ask for you to reach a conclusion about whether each of them was appropriate to receive gender-affirming surgery?
A They asked me to create a plan, a treatment plan. They actually thought that none of these people were appropriate for surgery because it wasn't -- it wasn't part of the general zeitgeist in those days in prison systems to provide surgery.
Q And of the -- and I assume you -- I'm sorry. I assume you completed treatment plans for all 12 individuals?
A I did.
Q And of the 12 treatment plans you created, did any of those treatment plans conclude or recommend that surgery was appropriate or otherwise recommend surgery?
A Surgery was a possibility in the future.

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Q For all 12 of them?
A Well, you know, one of them was near death, you know. There were 12 different people with 12 different, you know, disturbed backgrounds, 12 different histories. And, you see, the initial consultant said that if a person is currently gender dysphoric and wants surgery, they ought to have it. It was medically necessary.
Q Let me ask the question this way. In the 12 treatment plans you created, did all of these treatment plans leave open the possibility that in the future the prisoners might be able to obtain surgery?
A Again, I said to you I don't have a crystal ball about the future. I would say the answer to that is likely to be yes. It left open the possibility if certain -- No. 1, if the law changed, if the person had psychotherapy, if the person -- if the doctors who are dealing with the person -- I should say clinicians dealing with the person had a really good sense of their developmental history and their ability to give informed consent, yes. Given the fashion that transsexual people outside prison are getting surgery, there was a possibility but not now and not on the basis of a one or two-hour

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visit.
Q I understand that you may have and have consulted on individual cases for prison systems other than Massachusetts, but have you had the sort of ongoing role for any prison system other than Massachusetts?
A No. I have been to various prisons, to New Jersey and to Virginia and to California and to Washington State to consult on individual prisoners.
Q All right. And outside of Massachusetts, approximately how many gender dysphoric prisoners have you been asked to consult on?
A If you take the list that I just gave you and add one to that because in Washington I -- no. In Washington, over time on two different occasions, I think I was involved with three prisoners. And in Virginia, there was a -- there was one prisoner, and in New Jersey, there was a prisoner. In Florida, there was one prisoner. So, again, excluding Massachusetts where there's a huge number of prisoners, that would be it.
Q So it sounds like we're talking about maybe --
A California two, two in California.
Q So I am not going to hold you to a precise number, but it sounds like we're talking about six or eight

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different prisoners?
A I would say eight would be the maximum.
Q Okay. And were these all in the context of litigation?
A No.
Q Okay.
A No, not at all. Well, some were.
Q Doctor, we're at just about 90 minutes right now. I'm happy to go for a couple more minutes to reach a more natural breaking point if you would like, but I also want to make sure I respect your request for a break every 90 minutes if you'd like to take a break now.
A I would, but it doesn't have to be a long break. I will be back in one minute, if you don't mind.
Q Well, I have to use the facilities real quick, so why don't we say three or four minutes.
A Okay. Very good.
Q Thank you very much, Doctor.
(A brief recess was taken.)
Q Doctor, of the -- before the break we were talking about individual cases where you had offered consultation concerning gender-affirming care provided to inmates. Do you recall that?
A Yes.

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Q And in a number but not all of these cases -- or a number but not all of these cases arose in the context of litigation. Is that a fair statement?
A Yes.
Q Okay. In the cases where you have offered either an expert report or testimony concerning gender-affirming care to a prisoner, I assume in every single case it's been the relevant department of correction that's hired you?
A Yes. I think the Florida case was a private law firm, but maybe the department of corrections hires the law firm.
Q But you testified on behalf of the State in that case, is that fair?
A In Florida?
Q Yes.
A I'm not sure.
Q That's --
A You know, the legal context -- I keep learning about the legal context. I think the most honest answer is I'm not sure.
Q That's perfectly fair. The Florida case, is that the Keohane case? Do I have that right?
A Well, you're not pronouncing it right, but no one ever does, so, yes, that's right.

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Q It's K-e-o-h-a-n-e.
A I think he pronounces it Keohane, but I'm not sure.
Q I was just spelling it for the court reporter, but I have the spelling right, correct?
A No. You -- that's right.
Q Okay. And in these cases, have you ever offered testimony that you believe that gender-affirming care was -- or gender-affirming surgery was appropriate for a prisoner?
A The Virginia case, which is not in the category that you're talking because I think Virginia just asked me what to do with this case, I just remember there was another California case that was not involved with litigation. I recommended that there was a pathway to surgery relatively soon, but then the patient got discharged from prison. The inmate got discharged.
Q And you're familiar, I assume, with the Koselik case in Massachusetts?
A Yes.
Q And did you offer testimony in this case that gender-affirming surgery would be appropriate for Ms. Koselik?
A No. In the testimony, I thought that the adequate -- there was adequate treatment, adequate

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treatment for her gender dysphoria in the case with 2006. Subsequently, I was on the committee that approved sex reassignment, vaginoplasty, for this person. And Koselik has been operated on now and is living in a female prison.
Q So as part of your role on that committee, you assisted in approving the surgery?
A Yes. I voted yes.
Q Okay. And when you began that answer, you said that -- I'm paraphrasing you -- but in 2006, you offered testimony that the care that she had been receiving was adequate?
A Yeah.
Q Did you misspeak there?
A No.
Q I thought it was my understanding that you offered whether or not concerning surgery at the outset you offered testimony that the care she was receiving was inadequate. Do I have that wrong?
A You have it wrong.
Q Okay. I apologize. You know that case better than I do, so I'm sorry for that.
A Well, we will hope so, but it was 2006.
Q That's fair. Prior to this litigation, have you ever provided consultation regarding an inmate

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incarcerated with the Indiana Department of Correction?
A No.
Q Okay. Are you aware -- and you may not be -- that before the enactment of the statute that we have challenged in this case the Indiana DOC approved two different inmates to receive gender confirmation surgery?
A I became aware of that two days ago.
Q All right. And I assume you did not play any role in the evaluation of these two inmates?
A That's correct.
Q Okay. Okay. Have you ever personally administered any sort of psychometric or psychological testing to an inmate? I'm sorry. Not to an inmate. To a patient?
A I already told you that in the Case Western Reserve in our evaluation process over many, many years, these psychological tests were an integral part of the evaluation.
Q Sure.
A Yes. And did I -- maybe I misunderstood the question. You said did I ever, and the answer is repeatedly.
Q Okay. And I guess I was attempting to distinguish

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between the clinic and you personally. Were you personally responsible for administering these tests?
A No. No. These tests are self-administered tests. The patient does it by themselves.
Q And the two tests you mentioned are known as the MMPI and the MCMI. Am I correct on that?
A Yes. They're all true/false questions.
Q Are those the only two psychometric tests that have been administered at the clinic to dysphoric patients?
A Generally speaking, yes.
Q And you say they're self-administered. These are tests where the patient is given a list of questions and answers them?
A Yes.
Q And are you personally responsible for interpreting or scoring the test results?
A No.
Q Who's responsible for that?
A Well, No. 1, the computer generates an interpretation, but we don't follow the computer. We take that into consideration, but we have an independent psychologist who is trained in the interpretation of these tests, and we get usually a

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one-page report that combines -- when we do both tests, it combines the results of both of those tests.
Q And I assume that prior to the invention of computers the tests went directly to the independent psychologist to interpret?
A Yes.
Q So it sounds like you are not trained to interpret the results of these tests, is that fair?
A No. Like most psychiatrists, we don't undergo training for that.
Q Training on this particular issue. You're trained in other matters, right?
A Other matters, yes.
Q I was joking. Okay. Doctor, you're familiar, I assume, with the -- I'll just say the complete name once -- but with the Standards of Care for the Health of Transgender and Gender Diverse People that is published by WPATH, correct?
A Am I familiar with WPATH as an organization or --
Q Are you familiar with the standards of care that they publish?
A Yes.
Q And the current version is Version 8, which is sometimes referred to as SOC8, is that correct?

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A Yes.
Q And my understanding is that you were involved in the drafting of Version 5 back when WPATH had its predecessor name?
A Yes.
Q Okay. And that was the version that came out in 1999?
A Yes.
Q And you were the -- do I have the title right? You were the writing chair for that version?
A I was just the chair. I didn't have the term "writing chair," but I did the writing, right.
Q Did you write the entire Version 5 or significant portions of it?
A I wrote significant portions of it. And, for example, George Brown wrote the part -- the section on prisoners, but I integrated everyone's writings, you know, into one writing style, and it was my writing style.
Q And I assume you approved every single word before it was released?
A Yes.
Q Okay. Is that the only version of the WPATH standards of care that you were involved with?
A Yes.

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Q And forgive me for being crass because I really don't know what happened. It's my understanding that you had a falling out, for lack of a better word, with the organization at some point after Version 5 was released?
A Can I fill you in on the details?
Q I was going to say please feel free to use different words than I used.
A Yes. I wouldn't use the words "falling out."
Q Okay.
A I presented -- we presented the fifth version, the draft of the fifth version of standards of care to the executive committee. And the president of the executive committee was the only one on the committee who took umbrage at one thing in our standards of care, and that is our requirement that two independent mental health professionals should recommend or see the patient before hormones were given. He was outraged at this, and he vowed in front of the executive committee that while he appreciated our work in general and he liked the standards of care, he didn't like that, and he found it so offensive that he was going to immediately appoint a new committee. And in 2001 or 2002, pretty much the 21 pages of our standards

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of care were identical to the new standards of care, the 6th version, but the 6th version had one letter of recommendation required for hormones. And in 2002, I believe I attended the every-two-year meeting of Harry Benjamin Society, and this time the audience was filled with cross-dressed men, trans-identified men. And during the plenary sessions, if they heard something they didn't like, they booed. And this was, in my view, a scientific organization. We're all trying to figure out from the '70s what in the world was going on here and what should the medical professional do about it. And if we, in fact, gave prisoners or patients what they wanted, what would be the outcome? And so these were the major questions that we were trying to figure out as an international group.

But when the patients were in the audience and when they booed, I -- when Dr. Green, who was the chair -- who was the head of Harry Benjamin Society in 1999, when he alone objected to this and used his power to redesign the 6th Standards of Care, I realized that the organization that I thought was a scientific organization had become an advocacy organization. And it was very hard to give a talk

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knowing that if you said something that raised questions about the motives and the wisdom of surgery or hormones for certain people, the audience would boo.

And so the combination of my basic notion that this was a -- my naive notion that this was a scientific organization and it, in fact, had become in the years I had been there a -- gone from that kind of organization to an advocacy for sex reassignment surgery -- that's how we called it in those days -- that I wasn't sure that the science or knowledge base enabled us to be an advocacy organization. And so I'm basically a fellow who is always trying to figure out what is the nature of this, and what is the nature of that. And I recognized that there's a difference between scientific inquiry and advocation, and so I -- what you called my falling out was a resignation in 2002 or 2003. I just didn't pay my dues and so --

Q So you terminated your membership in WPATH?
A I just -- right. I stopped going.
Q Have you been a member of WPATH since that time?
A No.
Q I'm sorry?
A No.

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Q Okay. Okay. Doctor, I'm looking for just the two-sentence version here, but in general, what is gender dysphoria?
A Gender dysphoria is an interpretation of one's psychic pain that's based on the fact that I have a gender identity that doesn't match my body.
Q You agree that it is a diagnoseable mental health disorder?
A Yes.
Q Okay. And it's listed as such in the current version of the Diagnostic and Statistic Manual Of Mental Disorders, the DSM-5, and its text provision?
A Yes.
Q Okay. And it's my understanding that both the DSM-5 and the DSM-TR identifies several criteria for the diagnosis of gender dysphoria, is that correct?
A Yes.
Q And in your clinical practice, are these the criteria that you apply in order to determine whether to diagnose someone with gender dysphoria?
A Well, that's a bit of a joke, actually. The patient comes in with a diagnosis. You see, when people come in with pain in their abdomen, the

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doctor diagnoses the source. The patient doesn't come in and say, I have an infected gallbladder, Doctor, or I have diverticulitis. But in these cases, a person comes in and says, I have gender dysphoria. And so we just ascertain, you know, has it been there for six months? Does it cause any impairments in your social, educational, or occupational functioning? Do you want to have -- do you want to have the body parts of the opposite gender? Do you dislike your primary and secondary sexual characteristics? Do you feel like you have the feeling your subjective world is much more close to the opposite gender?
Q Is it fair to say that they come in and say, hey, I have this problem, and at that point, it's your job to determine if they meet the clinical criteria for formal diagnosis of gender dysphoria?
A Yeah. That's the apparent job, but what I'm saying is a bit of a joke is the patient tells you the diagnosis. And based upon our experience in the '70s and '80s and in the '90s, many people have read about the criteria for gender dysphoria, and they tell us -- they tell us that they meet the criteria in their narrative. You don't know, but in the 1970s, the doctor wanted to distinguish the

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true transsexual from what was called the secondary transsexual, and then we discovered after about 10, 15 years --
Q Doctor, I'm so sorry. We have gone a little far from where the question --
A No, we haven't. No, we haven't.
Q Doctor, my question was when a patient comes in the door and says, hey, I think I have this problem, it's your job or the clinic's job to determine if they meet the clinical criteria for formal diagnosis of gender dysphoria, is that correct?
A And it is whether they're telling the truth.
Q Okay. So, yes, it is your job to decide if they meet the clinical criteria, is that correct?
A And if they're telling us the truth.
Q Okay. I just -- and the only problem here is because there's a court reporter writing this down, Doctor, but the answer to my question is, yes, that's the clinic's responsibility, and it's also their responsibility to determine if the patient is telling the truth, is that correct?
A Yes.
Q I'm sorry?
A That's correct.
Q Okay. And in determining whether a person carries

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a clinical diagnosis of gender dysphoria, I assume you apply the criteria in the DSM-5 or its text revision?
A Yes.
Q Okay. And you agree that self-report can be helpful in diagnosing many mental health conditions, is that fair?
A Yes, can be helpful.
Q Okay. Do you agree that if not properly treated, gender dysphoria can cause a patient significant distress?
A The question is what is proper treatment?
Q I understand that, but the question presupposes that the patient is not being properly treated. Do you agree that if not properly treated, gender dysphoria can cause a patient significant distress?
A The question is meaningless because we have a disagreement about what is the proper treatment. So I can answer that question yes and you could interpret it this way, and I interpret it quite the opposite way.
Q Doctor, I understand that we might have the disagreement on what proper treatment is, but do you agree in general matters that if a patient with gender dysphoria is not receiving proper treatment,

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however you define that term, the condition can cause the patient significant distress?
MR. CARLISLE: I'm going to object to the argumentative nature of the questioning. The doctor is trying to answer. Counsel cut him off. Please let him finish the question. He's trying to answer. These are complicated questions you're asking.
Q Do you understand the question, Doctor?
A I understand the question has a built-in ambiguity that would skew anyone's interpretation of the answer to that question. So the proper treatment sometimes could be no treatment. Sometimes it could be psychotherapeutic treatment. Sometimes it could be the administration of psychiatric medication, so what I'm saying is if you would ask me the same question by delineating your concept of proper treatment, I could answer the question, but as it now stands, it's too ambiguous for me.
Q Let me ask it this way. Do you agree there are circumstances in which gender dysphoria can cause a patient significant distress?
A Gender dysphoria for many people is a distressing situation. It is not a distressing -- well, again, gender dysphoria we're now talking about as a

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diagnosis. And if we're talking about gender dysphoria as a diagnosis, the answer to your question is it is associated with distress. Whether it's treated or not treated, it is associated with distress. But if we use the term transgender, a transgender-identified person, that may -- that person may or may not have distress. And so the treatment of a transgender person who gets no treatment other than recognition that you're a transgender person, that doesn't cause distress. That's -- there are transgender people who don't want treatment who don't feel they have a problem and who are not distressed and then meet criteria for gender dysphoria.
Q For a transgender patient with a diagnosis of gender dysphoria who is experiencing distress, do you agree that there are treatments that can assist in alleviating that distress?
A Yes.
Q Okay.
MR. ROSE: I'm going to go off the record for just a second, Gretchen.
(A discussion was held off the record.)
Q Okay. Doctor, I'm pulling up for you what I have marked as Exhibit 32, and I will just ask you

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generally first whether you recognize this document.
A I do.
Q And I will tell you that I have removed your CV from the report that Mr. Carlisle sent to us, but other than that, you recognize this as the expert report that you submitted in this case?
A Yes.
Q And did you draft this report yourself?
A Yes.
Q Okay. Did anyone other than you draft any portion of the report?
A No.
Q Other than the State's attorneys in this case, did anyone comment or make suggestions on the report before it was finalized?
A No.
Q I'm sorry. I couldn't hear you.
A No.
Q Okay. All right. And you have a hard copy of this report in front of you, correct?
A Correct.
Q And are you comfortable relying on the hard copy as we go through some questions which will allow me to bring other exhibits up on the screen?

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A Sure.
Q Okay. Will you flip to pages 14 and -- 14 to 15, I suppose.
A Okay. Give me a second.
Q You're fine.
A I'm on page 14.
Q Okay. And I guess spanning pages 14 and 15, you identify six parameters that you would use for assessing the safety and efficacy of gender-affirming surgery, is that correct?
A Yes.
Q I want to go through a couple of these one by one. I don't know that my questions are going to cause you to want to look at your report or not. You should certainly feel free to if you need to do so, but the first parameter you identify is the impact on genital dysphonia, correct?
A Correct.
Q And how were you defining genital dysphonia?
A I don't like -- we're talking just about males now, okay?
Q Okay.
A So I don't like the presence of my penis, my scrotum, and the contents of my scrotum. And I don't like to look at them, or they disgust me, or

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I would wish to be rid of them. And sometimes people express this by using terms like "down there," right, than specifically designating the word "penis," so --
Q Is it fair to say that for a transgender woman, genital dysphonia is the distress associated specifically with having a penis, scrotum, or testes?
A Yes.
Q Okay. And do you agree that in the right person, genital affirmation surgeries can cure genital dysphonia?
A I hope so. I think that's one of the major reasons or justifications for doing the surgery.
Q Okay. And I think you indicate in your report that the literature indicates satisfaction rates are generally from 72 percent to 92 percent, is that correct?
A Yes. But, you see, that term, "satisfaction rate," doesn't ever get clarified too explicitly. I'm presuming, and based upon what the literature is presuming, that when it comes to genital dysphonia, I hope that the satisfaction rates means I'm happy not to have these organs on me any longer.
Q But the initial dissatisfaction generally reflects

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surgical complications?
A Well, yes, in the immediate, you know, one, two, three weeks after a surgery, I would imagine that first not having the genitals, the male genitalia, is a source of satisfaction, and then having female-appearing genitals, even though you can't see them because of bandages, that's a source of satisfaction. Then the dissatisfaction comes from the experience of pain, but most importantly when they actually see their genitals, that if there's a problem with that, then they get dissatisfied that they don't have adequate-looking female genitalia.
Q And is it fair, Doctor, to say that the surgical complications, in your understanding, can range from extremely mild to more severe?
A Yes.
Q And minor complications can oftentimes be treated easily with over-the-counter medication or something like that to reduce symptoms such as nausea or headaches or something like that?
A No. I wasn't thinking about that, no. I was thinking about anatomical matters. Postoperative care with antibiotics or nausea medicine or pain medicine, that goes without saying, is just part of postoperative care. Those aren't complications.

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Nausea from an anesthetic, for example, is not -- that's not what I consider to be a complication or what surgeons consider to be a complication. It's, you know, the turning black of a new tissue. That's a surgical complication, you know, the -- for -- I just want to distinguish between ordinary postoperative distress, pain, discomfort, and nausea, sometimes the horror at the amount of blood that's being in the bandages, these are not complications.

Q My understanding is that there's an established system for rating surgical complications and their severity. Are you familiar with that?

A Not very, no.

Q Okay.

A There's what the surgeons call minor versus major complications.

Q Have you ever heard of the Clavien-Dindo scale?

A No.

Q For the court reporter, that's two words, C-l-a-v-i-e-n, and the second word is D-i-n-d-o. Doctor, just for the record -- and I'm sorry. I'm trying to cross things off here. You're not a physician, is that correct?

A I'm not a physician? That's not correct. I am a

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physician.

Q I'm sorry. You're not a surgeon, is that correct?

A I'm not a surgeon.

Q In paragraph 36 of your report, you cite a study with a complication rate, I think, of 28.9 percent. You agree that rate includes what you will call minor complications?

A I'm sorry. I'm trying to find the sentence. It's on page 16?

Q I'm sorry. It's on the very bottom of page 15 in the 2018 study of 330 patients.

A Oh, yes.

Q You agree that the complication rates reported there reflect minor complications, correct?

A Right now I don't know if the satisfaction -- I don't know if that's total complication rate or the minor complication rate without looking at the article.

Q Okay.

A I presume it's the total complication rate.

Q Some of the articles that you cited rate complications as a grade Roman numeral I, grade Roman numeral II, Roman numeral III. Are you familiar with that rating system?

A No. Actually, the term that you used that you

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spelled out for the court reporter, I have never encountered that in the articles that I have read. That's why I said I never heard of it. So if it is a standard, it's certainly not a standard in the articles that I read.

Q Okay. And are you familiar in general matters with complications being assigned a grade level followed by a Roman numeral?

A No, but that would make sense to me.

Q Do you believe that the articles that you cited used that grade system?

A I don't think so, but I cited a lot of articles, you know, read them a long time ago so...

Q Okay. Will you flip to paragraph 40 of your report? Let me know when you're there.

A I'm there.

Q In this paragraph, you provide what you call an edited abstract from -- a quotation from an edited abstract from an article published by Dunford and others, is that correct?

A Yes.

Q And by edited, I assume that you edited certain portions of the quotations that you used?

A Yes, just to make it more succinct.

Q Okay. I'm going to try to share my screen once

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again. I'm going to pull up what I have marked as Exhibit 33. Do you see that in front of you?

A Yes. Could you raise the font?

Q I have absolutely no idea -- I can try to zoom.

A I'm sorry. It's just -- I'll read it the way it is.

Q Okay. I found a way to zoom in. I'm sorry. There. Is that better?

A Yes. Thank you.

Q Okay. My first question is do you recognize this Exhibit 33 as the Dunford article that you cite?

A Correct.

Q Let me know if you need me to scroll down.

A Okay.

Q Do you recognize this as the Dunford article that you cite?

A Yes.

Q And on the first page of this article, I have highlighted a portion of the abstract that happens under -- the sub-header is emphasis and conclusions. Did you have an opportunity to read the highlighted portion?

A You're not talking about the abstract now, right?

Q We're still in the abstract, yes.

A Oh, under -- I'm sorry. The conclusions, yes.

Okay.
Q I'm sorry. Yeah. The sub-header under the abstract.
A I misunderstood your question. All right. "The evidence for gender reassignment surgery complications and functional outcomes is of the low level."
Q Doctor, let me just -- I'm sorry. Let me take you where I was going with that. My question to you is you agree that the highlighted portion of the first page here is the portion from which you provided an edited quotation in paragraph 40 of your report?
A Yes.
Q Okay. And the portion you just read said the evidence for GRS complications and functional outcomes is of low level, correct?
A Yes.
Q And it's my understanding that the phrase "low level" has an established meaning in scientific research. Is that a fair statement?
A That's correct.
Q The highest level evidence is evidence from randomized clinical trials, double-blind studies, stuff of that nature, is that fair?
A Systematic reviews of large numbers of articles,

yeah.
Q And you agree that something like a randomized controlled study cannot ethically be performed to determine to meet the efficacy of gender-affirming surgeries, is that fair?
A Well, this is a highly debatable question, and it involves intricate methodologic consideration. And given, you know, your time constraints and you're not willing to have me sort of give a discourse on things, I don't think I can answer your question affirmatively that it's fair. It's complicated. There could be random assignments to surgery, to not surgery. And for a one-year followup, a two-year followup, and the people who didn't get surgery after the designated period of time, if they still wanted to, could have surgery. So I think it's -- what we're up against is that many people feel based upon the fashion of doing surgery that it's medically necessary, and it's helpful, and therefore they say it's not ethical to withhold effective treatment.
But as you can tell from the rest of my expert opinion report, the question about whether the benefit on the mental health of a person which is the whole reason for doing these operations, that

the answer to that question is certainly not clear after 60 years of doing surgery. So I do believe it's possible, but there is no will to do ethical things, but the reason it's not done is not because it's unethical. It's not done because there's no will to do it. Surgeons want to do surgery, and patients want to have surgery. And so the answer becomes we can't answer the question in a scientific way.
Q So you think it would be ethical to withhold surgery from persons that a surgeon might think would benefit from the surgery?
A If the field after 50 years in a high level way cannot determine the benefits, the fact that a surgeon thinks that a patient would benefit is not as compelling as the fact that science hasn't demonstrated there's a consistent benefit from doing this.
Q My understanding is that evidence called low level technically refers to evidence from descriptive or qualitative studies or retrospective studies perhaps with a very small sample size, is that fair?
A What that really means is you can't be sure. If the evidence is of low level, low grade level, then

we can't be sure that the harms don't outweigh the benefits or that we can -- the benefits cannot be guaranteed. That's what low level means. If it says very low level, what that means is that the harms may distinctly outweigh the benefits. If it's a low level, we can't be sure that the benefits that are aspired to be achieved will be achieved. That's what low level means in a specific sense.
Q And you agree that scientists and practitioners rely on the level of evidence from time to time, correct?
A Ideally.
Q And it's my assumption that if one low level study is performed and then another low level study reaches the same conclusion, that a number of low level studies can add up to something that has greater significance to practitioners than any single study, is that fair?
A Yes. But, again, the evaluation of a group of studies cannot be done by simply -- if it's a surgical study, for example, it can't simply be done by surgeons. It has to be done by people who are much more sophisticated about scientific methodology. You see, I want my surgeon to be an

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expert as to how to do the surgery. That doesn't necessarily -- that expertise which I assume they have is not the same as the expertise in the scientific review of, say, 35 studies on the subject. Those are two different skill sets, and most surgical training programs do not train surgeons on methodologic evaluation of data.
Q Okay. And flipping back to paragraph 40 of your report, are you still there?
A Still there.
Q The first underlined sentence that you have there says, "The evidence for complications and functional outcomes is low and weak." Do you see that?
A Yes.
Q So it's my understanding that in editing this abstract, you changed the words "of low level" to be simply "low and weak", is that correct?
A Is of low level. You mean I added in "weak"?
Q You added in "weak" without noting that you changed the verbiage in the article, yes.
A Well, but I guess I did. I didn't realize I did. But, of course, that's what low level means.
Q Okay. Doctor, I would just tell you that because I don't want to waste your time going through the

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article at any length, you are absolutely correct that this Dunford article characterizes most of the research, most of the studies on this subject, as being of low level. It does, however, characterize one study of being of moderate level. Do you have an understanding as to what it means for a study to be of moderate level?
A I don't think moderate is the term that is used. Maybe -- wait a second. It probably means of likely benefit.
Q Okay.
A But moderate means without certainty, I think.
Q Okay. And I will just tell you that this study describes as being moderate level a study performed by Buncamper and others that was published in 2016, which I have brought up as Exhibit 34 on your screen.
A Uh-huh.
Q Do you see that in front of you?
A Very -- yeah.
Q I can scroll down here. Do you see that now?
A Yes.
Q Are you familiar with this study?
A Not right off the bat, no.
Q Okay. Are you aware that the study was cited

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multiple times in the SOC8?
A No.
Q This study describes itself as a retrospective study. What is a retrospective study?
A It means looking backwards. It means the -- it's the opposite of a prospective study. A prospective study we evaluate the patient by certain psychometric or certain objective terms and subjective terms, and then we do periodic future reevaluations using the same patterns, using the same instruments. And then we, at a predesignated time, say, two years or five years, we look at the comparison between the pre- and the postoperative state and make conclusions.
So a retrospective study doesn't have any of the pre -- it's just after the surgery is done, we then take a look at how the patients are faring hopefully both objectively and subjectively that is how they report they're doing.
Q Okay. In the conclusions in the study, the authors write, and I'm quoting here, that -- the portion I have highlighted on your screen spanning pages 1,006 to 1,007 they write, "After reviewing 475 penile and vaginoplasty procedures performed over the past 14 years, we conclude that successful

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vaginal construction is achieved in the majority of patients without the need for a secondary functional reoperation. Intraoperative complications are scarce. The prevalence of postoperative complications is high but most are minor and can be easily treated."
Did I read that correctly, Doctor?
A Yes. You're an excellent reader, Mr. Rose.
Q And my assumption is that intra, i-n-t-r-a, operative complications are those that arise during the surgery itself?
A Or -- yeah, that would be like bleeding.
Q Sure. And that's distinguished from postoperative complications which arise after the surgery?
A Yes, and divided into first 30 days with up to 6 months, 1 month to 6 months and then 12-month complications.
Q Do you agree that 475 patients over the span of 14 years is a decent sample size?
A Oh, yes. You see -- yes, certainly.
Q And before today were you aware of this article?
A I don't know.
Q Is there a reason that you did not mention it in your expert report?
A Probably because if it's not in my report, it's --

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I'm not aware. As I think I said to you, if you put in PubMed "vaginoplasty," you get 11,000 articles and --
Q Well --
A It's one of the many thousands of articles I haven't read.
Q And that's certainly understandable. I will readily admit I have not read every legal decision out there, but Exhibit 33, the Dunford article, you did cite in your report characterizes exactly one study as being of moderate level rather than being low level, and I was wondering why you did not take it upon yourself to find a moderate level evidence.
A Maybe I was lazy, and maybe I was rushing. I don't know. You need to understand that retrospective studies done by surgeons -- I don't know whether -- you see, I don't know how many people died, how many people suicided. This is talking about the surgical complication rates. It's not talking about anything else. It's not even talking about whether -- about genital dysphonia or gender dysphoria or mental health. It's just saying that from a retrospect of 475 operations done by most likely a series of surgeons over a 14-year period, generally speaking, the -- and we have this term

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"scarce," which is a very unusual term for a surgeon to use. We usually use "the surgical complication rates were low." I don't know, you know, what -- or they say it's 5 percent or less. I have tried to quote surgical articles and give an actual percentage rate. And so if 9 percent -- if 9 percent of people have to have a second major operation, you know, a rescue operation, you can decide whether 9 percent it means -- is scarce. It's not about this article.
The other thing is if the vast majority of articles show inconvincing evidence and if one shows convincing evidence, what do we make of that? You see, in science, one study is not enough to prove anything. One study is enough to generate a hypothesis that needs to be tested.
Q Okay. Doctor, the second parameter that you cite beginning on paragraph 41 of your report, is the impact of gender dysphoria. Do you see that?
A Oh, yes.
Q And when you use the phrase "gender dysphoria," here are you using it consistent with how it is defined in the DSM?
A Yes, about the sense of living in one's body in a way that causes distress.

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Q And are you referring to it here as a clinical diagnosis, gender dysphoria, I guess was my question?
A I'm sorry. Would you repeat that, Mr. Rose?
Q Are you referring to it here as the clinical diagnosis, gender dysphoria?
A No. I'm suggesting that gender dysphoria has two different meanings. One is -- it's a psychiatric diagnosis, yes or no, and the other thing is it is the subjective discomfort with the self because I want to be a woman, for example, and I don't feel completely feminine. So it's the continued dissatisfaction with the gendered and anatomic self. And I know this is confusing, but the treatment is not of the diagnosis. The treatment is justified on the basis of the diagnosis, but the goal of treatment is to remove or significantly ameliorate the subjective gender dysphoria of living in a body that doesn't match my gender identity and ambition to be much more -- appearing more much more a woman so I can feel more comfortable with my sense of self and my living in my body, and that's just the confusion between the terms.
Q Is it fair to say here that you're using the term

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"gender dysphoria" to refer to a symptom rather than that clinical diagnosis?
A Yes.
Q Okay. And you agree that gender-affirming surgery -- excuse me -- that genital affirmation surgery can ameliorate a patient's gender dysphoria to the extent the gender dysphoria is focused on the genitals, is that correct?
A That's why I say the high satisfaction rates may very well be about the absence of male genitalia.
Q And I'm sorry. I might have just missed the first word to your answer, but did you say yes?
A Yes. I was clarifying my answer.
Q That's perfectly fine. I just didn't hear you. I'm sorry. And you agree other types of affirmation surgery can ameliorate a patient's gender dysphoria to the extent their gender dysphoria is focused on those other body parts, Is that fair?
A Yes. Ameliorate means improvement. Do we agree on that meaning? It can lessen the -- it can lessen.
Q Yeah, of course. In paragraph 43 of your report, you identified five types of observations that suggest that gender dysphoria persists after gender confirmation surgery for an unknown number of

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patients. Do you see that?
A Yes.
Q I have a question about a couple of these, but the first is that some seekers obtain additional surgery. Do you see that?
A Uh-huh.
Q Is that yes?
A Yes. I'm sorry.
Q That's for the court reporter, not me. And this might be because the persons who have one type of gender confirmation surgery such as genital surgery might continue to experience dysphoria related to other body parts, is that correct?
A Yes.
Q Okay. It's possible that the person always planned to have surgeries in sequence such as they always planned on the second surgery?
A That's -- I guess it's possible, but that's not my usual experience. The usual experience, especially with prisoners, is that they say, this is the only thing I want.
Q Okay. The second observation you note is that some persons detransition after a vaginoplasty. A small number will ask the surgeon to re-create the appearance of male genitalia. Do you see that?

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A Yes.
Q And the study you cite there is a 2016 study by Djordjevic and and others, is that correct?
A Yes.
Q For the court reporter, that's D-j-o-r-d-j-e-v-i-c.
A That's J.
(Exhibit 35 was marked for identification.)
Q Oh, did I say G? I'm sorry. D-j-o-r-d. Thank you. Okay. I am bringing up what I have marked as Exhibit 35. Do you see that on the screen?
A Yes.
Q Do you recognize this as the Djordjevic study that you cite?
A Yes.
Q And on the first page, I have highlighted a portion of it. Under aims, the author describes that the aim is to analyze retrospectively seven patients who underwent reversal surgery after regretting their decision to undergo male-to-female sex reassignment surgery elsewhere. Do you see that?
A Yes.
Q All right. Okay. Is it fair to say that this study did not attempt to determine anything about the rate of regret?
A No, they couldn't.

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Q And that's because they were only analyzing persons who had already decided that they wanted reversal surgery, correct?
A Right. This study is significant only in the fact that there are people who regret having sex reassignment surgery who go so far as to find another person to restore their male genitalia. That's the only significance of the study.
Q So you only cited this to note that some persons have in fact requested reversal surgery, is that fair?
A (Inaudible.)
Q I'm sorry, Doctor. I might just be having difficulty hearing. Did you yes?
A I said that's all, yes.
MR. CARLISLE: Gavin, I'm sorry to interrupt. Could you zoom in on the next exhibit just for me? I'm have a little trouble seeing the screen.
MR. ROSE: On this exhibit?
MR. CARLISLE: No, on the next one.
MR. ROSE: Of course. And I don't think we're quite there yet, and all of these are published in the tiniest font possible, and that's not my fault.
Q Okay. Doctor, I'm looking at paragraph 44 of your report. Do you see that?

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A Uh-huh.
Q Yes?
A Yes.
Q I'm sorry. And the third sentence in that paragraph you write, "One illuminating criticism, for example, is that to qualify as regret a person has had to tell the surgeon this at a follow up visit even though it is known that at least 75 percent of detransitioned patients do not return to the surgeon and that suicides are not considered to be regret."
Did I read that correctly?
A Yes.
Q And the article you cite for that is an article published in 2021 by Littman and -- or I guess just by Littman, is that correct?
A Yes.
Q And I have pulled up Exhibit 36 on your screen. Can you see that okay?
A Yeah, I can see it.
Q Sorry. I'm trying to remember where the zoom button is.
A Okay.
Q This is the Littman article that you cite, is that correct?

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A Yes.
Q Are you're familiar with Dr. Littman?
A Yes.
Q And you're aware that she was responsible for coining the term quote, unquote, rapid onset gender dysphoria to refer to gender dysphoria diagnosed for a first time during a patient's adolescence?
A I think the simple answer to your question is yes.
Q And you agree that that term, rapid onset gender dysphoria, has been sharply criticized by a large number of professional organizations including the American Psychological Association and the American Psychiatric Association?
A And I'm aware the outcome of those things too that the study was reanalyzed, and it was reaffirmed only when advocates of -- well, see, in 2018 --
Q I'm sorry. Doctor, I don't mind that you're explaining, but I didn't actually get an answer to my question. The question was simply you understand that a large number of professional organizations sharply criticized Dr. Littman's use of that term, correct?
A And the answer is yes, and I'm aware that as a result of -- I don't know if it's a large number -- but there were organizations that criticized the

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study, and it caused the data to be reanalyzed, and the conclusions were exactly the same.
Q And by this reanalysis, do you mean that Dr. Littman published a correction to her original article?
A I think so, yeah.
Q During this correction, a portion of her correction was designed to make it clear that some of the data she obtained from publishing a poll or survey on websites that some persons thought might be biased?
A Yes. But bias goes both ways, and it is amazing in this field there is such animus and such attack that has not seen in any other medical field. And Dr. Littman has been the object of enormous attacks over the years, as have many other people who don't seem to buy the fashion-based medicine party line, and so this is --
Q Doctor, in paragraph 44, you cite this Littman article, Exhibit 36, for two propositions, first, that at least 75 percent of detransitioned patients do not return to the surgeon who performed the confirmation surgery, and, second, that suicides are not considered to be regret. Is that a fair summary of these statements for which you are relying on this article?

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A Yeah. But the second idea is not the same as the first. They are two different concepts.
Q But you, as you sit here today, cite this Littman article, Exhibit 36, for both of those concepts, correct?
A No. The suicide rates are not considered regret. I guess I should have -- I should have put the Littman citation after the word "surgeon."
Q Okay. So you cite this for the proposition that it is known that at least 75 percent of detransitioned patients do not return to the surgeon?
A Based on the Littman review of those 100 cases.
Q Okay. And it's my understanding that Dr. Littman in this article reviewed survey answers from 100 respondents who described themselves having quote, unquote, detransitioned?
A Yes.
Q So it again was not attempting to determine regret rate, is that fair?
A No. It can't determine rate on the basis of the method she used.
Q Okay.
A It's the same kind of concept that we talked about for the surgical, previous exhibit.
Q Do you believe that the article was attempting to

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distinguish between regret following gender confirmation surgery as opposed to regret following social transition or nonsurgical intervention?
A I think a large number of these 100 people have had surgery, but it may -- you have to refresh me. I think you're going to do that now.
Q I'm going to -- I'm going to scroll down to page 3361 of the report on table 4 where Dr. Littman describes the 100 respondents. Do you see that?
A Yes.
Q And you agree from this table that of the 100 persons who responded to her survey, only 6 had undergone genital surgery?
A To create -- yeah, okay.
Q So do you believe this article still stands for the proposition that at least 75 percent of detransitioned patients do not return to the surgeon?
A Well, I don't recall whether it's -- let's see. There were -- there were -- there were 29 people who had surgery. Wait a second. There's face and neck surgery, 5. I haven't read this article for a long time, and so you have to give me some time here.
Q We can just move on. The article speaks for

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itself, so I don't want to waste your time going through it.
A What does it say? When you say it speaks for it yourself, what are you saying it says? I'm not allowed to ask you questions. Sorry.
Q I was just about to tell you that, although if anything close to that 75 percent figure is in this article, I have not noticed it. Okay. In paragraph 45 of your report you say, "In a 2011 study of all patients who had surgery, both trans men and trans women, the suicide rate was 19.1 times the rate among control Swedish population."
Do you see that?
A Yes.
Q I'm so sorry. Do you know how to pronounce the author's last name?
A Why don't we just call her Cecilia because everyone can agree on how to pronounce her first name.
Q That's perfectly fine. And her last name is D-h-e-j-n-e?
A Dhejne.
Q I'm perfectly fine calling her Cecilia. I just want to make sure the record reflects that that's what we're talking about. I had to close a couple of these just because the thing I need to click on

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is right under the stop share button. Okay. I have pulled up in front of you Exhibit 37, which I think is the Cecilia study you cited; is that correct?
A Correct.
Q It's my understanding from reading this article that the article is comparing persons who underwent confirmation surgery in Sweden in the 1970s and 1980s to the general population, is that correct?
A It's over a 30-year period, Mr. Rose. It's not just the 20-year period.
Q And, again, the article speaks for itself. I understand they might have accumulated data after the '80s, but I think the article does say that the persons they were studying actually received surgery in the '70s or '80s even though they continued to follow these people for decades after that. Regardless of the date, this article was comparing persons who underwent confirmation surgery in Sweden to the general population, correct?
A Yes, to the general population of born in the same month, in the same year, and they had two control groups, I think one biological males and one biologic females.

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Q So it was attempting to -- so the 19.1 times figure that you mentioned, is that persons after confirmation surgery commit suicide at greater rates than non-transgender persons in the general population, is that correct?
A That's right. After they were cured of gender dysphoria, according to the modern thinking in 1970 and the 1980s because you need to understand that that's what people thought the surgery did, cure gender dysphoria.
Q And on page 7 of the report, the author actually indicates that, "The results should not be interpreted as such that sex reassignment, per se, increases morbidity and mortality. Things might have been even worse without sex reassignment. As an analogy, similar studies have found increased somatic morbidity, suicide rate, and overall mortality for patients treated with bipolar disorder and schizophrenia."
Did I read that correctly?
A Yes. May I comment on that?
Q No. My question is whether you agree that the study should not be interpreted to indicate that confirmation surgery as such increases morbidity and mortality.

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A Do I agree? No, I don't agree.
Q So you have a different interpretation of the study than the study's authors?
A I do.
Q Okay. But is it fair to say that the study was comparing persons with a mental health diagnosis to persons without a mental health diagnosis?
A That wouldn't be fair to say.
Q So you don't think that would be fair? I'm sorry. Did you answer the question?
A Yes. I answered the question, no, I don't think it's fair.
(A discussion was held off the record, and a brief recess was taken.)
Q Back on the record. In the next paragraph after the portion that I read you from this psychological study, the Cecilia study, the authors write, quote, unquote, "This study reflects the outcome of psychiatric and somatic treatment for transsexualism provided in Sweden during the 1970s and 1980s. Since then treatment has evolved with improved sex reassignment surgery, refined hormonal treatment, and more attention to psychosocial care that might have improved the outcome."
Do you see that?

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A Yes.
Q I assume you agree that treatment techniques for gender dysphoria have improved since the '70s and '80s?
A I think they're talking about the surgical techniques. I hope that that's true. I believe it's true. I think that's how surgery advances. So when it comes to -- I would just want to answer your question in terms of surgery, per se. Refined hormonal treatment, yes, I think in the early '70s an estrogen was used that led to a large number of blood clots, and so that estrogen is not used anymore, generally, so I think death or hospitalization from blood clots has improved. People died from blood clots, and I don't know what psychosocial care might that she might be -- that this group might be referring to. I kind of think that in the 1970s and '80s if someone had a gender -- I should -- tell me if you don't want to hear this. Published in this study is the number of people who were screened by the national organization that does screening in Sweden, and a large number of people were rejected for sex reassignment surgery. And I think one of the basis for that rejection was they were thought to be too

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mentally ill, and what is so shocking to people like myself is that the same data, long-term data, was available on those people who didn't have sex reassignment surgery with comparing it to those who did have sex reassignment surgery. And sort of every methodologist who has looked at this study have had a sense of sadness that they did not study the people who didn't have sex reassignment surgery as a control group, as an additional control group, so I don't know really what Cecilia and her colleagues mean by improved psychosocial care. We were aware in the '70s and in the '80s that many of these people had concomitant major mental illness, and so -- so I don't know what she's referring to. She may in fact be right that there was improved care, and therefore the outcomes may be better.
Q Do you agree that there are other factors in addition to or possibly in addition to care such as greater acceptance in the community which might have also led to improvements in suicide rates among transgender persons since the '70s and '80s?
A I hope that is true, yes.
Q You note in your report, I assume, you're aware more recent suicide rates are lower than 19.1 percent?

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A They're far lower, and they're still very elevated.
Q And the number that you provide in paragraph 45 of your report is that the suicide rate amongst transgender persons ranges from 3.5 to 6 times higher than the general population, is that correct?
A Yes, I wrote that.
Q And these figures are among all transgender persons, correct, whether or not they had confirmation surgery?
A I think that's probably largely true. They're a mixed bag of those who have and haven't.
Q And you agree that figure would include transgender persons who have been denied surgery or other forms of treatment, correct?
A Or have chosen not to have surgery.
Q Sure.
A It very much depends on the country, Mr. Rose. In America, if therapists or committee X denies, they go to somebody else and get it. That's not true in Sweden.
Q And you agree that the authors of the Cecilia study actually felt that confirmation surgery improved patients' genital dysphonia, correct?
A Well, I don't think they were using the term

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"genital dysphonia." They were talking about gender dysphoria.
Q But you agree that they felt that confirmation surgery improved their gender dysphoria?
A What I'm agreeing to is that they undertook the surgery because they believe this would improve their gender dysphoria. In those days, people advertised sex reassignment surgery as a cure for gender dysphoria. We don't do that anymore. Even surgeons don't do that anymore.
Q And my question, Doctor, was you agree that the authors of this study actually felt that confirmation surgery improved patients' gender dysphoria, correct?
A That's because they were doing it. You see, it's really important to believe in the treatments that you're offering people, especially if you're changing their anatomy in an irreversible way and making them sterile. In order to do that, you have to believe that you're helping them. So you're asking me do they believe they are curing their gender dysphoria? Yes. But Cecilia and her colleagues had the wisdom and the courage to actually do a follow-up of everyone who had sex reassignment surgery over a 30-year period. That

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was unheard of. This is the first study of this kind --
Q Doctor, I'm sorry. We have gone beyond answering the question at this point. In paragraph 48 of your report, you described the third outcome parameter that you use, impact on -- I'm so sorry, Doctor. I completely forgot. You had asked for a break right now. Do you want to go ahead and take that break?
A Yeah, that would be great. Thank you.
(A brief recess was taken.)
Q Back on the record. Okay. Doctor, beginning on paragraph 48 in your report, you start talking about what you describe as the third outcome parameter which is impact on the mental health of gender confirmation surgery. Do you see that?
A Yes. 48, right? Paragraph 48?
Q Paragraph 48, correct. And about, oh, a third of the way down, that large paragraph there, you say, "Recent studies recognizing the uncertainty of the mental health benefits of GCS concluded that genital surgery improves mental health."
Do you see that?
A Yes.
Q Okay. And one of the studies that you cite is a

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study conducted by Almazan and others, is that correct?
A Yes.
Q And I have pulled up on my screen what I marked as Exhibit 38, which I will make a little bit larger for everyone. But you recognize this as the Almazan study you cite, correct?
A Yes.
Q All right. And you agree -- and I'm reading the objective here -- but you agree that the authors in this study sought to evaluate associations between gender affirmation surgery and mental health outcomes including psychological distress, substance use, and suicide risk, correct?
A Uh-huh.
Q Yes?
A Yes. Yes.
Q And on -- I'm sorry. I'm looking for the number. On -- I'm still on the abstract but on the first page of the exhibit, it notes under results that of the 27,715 respondents, 3,559 endorsed undergoing one or more types of gender-affirming surgery at least two years prior to submitting survey responses. Do you see that?
A Yes.

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Q And you agree that 3,559 is a large sample size?
A Yes.
Q And on page 615, the author's report -- and I'm quoting here -- "After adjustment for sociodemographic factors and exposure to other types of gender-affirming care, undergoing one or more types of gender-affirming surgery was associated with lower past month psychological distress, past year smoking, and past year suicidal ideation. After Bonferroni correction, there were was no statistically significant association between gender-affirming surgery and past month binge alcohol use or past year suicide attempts."
Did I read that correctly?
A You did.
Q And you agree that these are some or all of the results of this study?
A That's -- that's the result of the study. The question is whether there's any validity to the study.
Q In paragraph 48 of your report, you criticize this study as saying the latter article failed to mention that over half of the 27,715 subjects rated their mental health as poor/severe. Do you see that?

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A I don't see it, but that sounds like I wrote that, yeah.
Q Okay. I will tell you it's paragraph 38A of your report.
A Okay.
Q And it's --
A Oh, yeah. I see it.
Q You see it? And when your refer to the latter authors there, you're referring to Almazan and his or her coauthor, correct?
A Yes. Yeah. Keuroghlian.
Q I wasn't going to try to pronounce it, but I commend you for doing so. And I guess my first question is you understand that the authors of the Almazan study were not attempting to study all 27,715 respondents to the survey, correct?
A On these parameters, yes, but they -- yes.
Q They were attempting to study only the 3,559 persons who received surgery, correct?
A That's right.
Q Okay. Do you know how many of those persons rated their mental health as poor/severe in the surgery responses?
A I don't.
Q Okay. I'm sorry. I'm going to flip over -- let me

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ask it this way. But the citation you provide for the statement that over half of the 27,715 subjects rated their mental health as poor/severe, was to an article by Miller and others in 2023, is that correct?
A Yes.
Q Okay. And I have pulled up on the screen for you what I have marked as Exhibit 39, and my question to you is whether you recognize this as the Miller study that you cited.
A At the moment, I don't recognize it, but I trust you.
Q Okay. I will tell you it has the same authors and same title as what you cited in your report, so I would be very curious if they were not the same.
A Well, I trust you.
Q And this is a different study that analyzed the same survey responses for a different purpose, is that fair?
A Yes.
Q Yes?
A Yes.
Q I'm so sorry, Doctor. It might be my hearing. I'm not trying to be rude. I'm having trouble hearing you from time to time.

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A I'm a mumbler.
Q And looking at the portion I have highlighted on page 1 of this study under main outcomes and measures, it describes the outcomes measured as self-rated health dichotomized as poor or fair versus excellent, very good, or good as well as severe psychological distress, open parentheses, scoring a validated threshold of greater than or equal to 13 on the Kessler psychological distress scale. Do you see that?
A I see it.
Q So it's my understanding from reading this study that there are actually two different survey responses that the authors here analyzed. One was a self-report of their health, and the other was whether they met qualifications for psychological distress.
A Okay.
Q Do you have an understanding as to whether that's correct?
A Again, you know, it's been a long time since I read the study, and I trust you.
Q Okay. Well, in your report, you say that over half of the 27,715 subjects in that survey rated their mental health as poor/severe.

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A Is that --
Q I'm wondering if in order to get that number you aggregated the number of persons who reported their mental health as poor or fair and added to that the number of persons who, on a separate question, responded, yes, I experience severe psychological distress?
A I don't recall. Do you know that I, in fact, made that error or aggregated those two? I just don't recall.
Q Okay. You agree that assuming that those are two separate questions, there is likely going to be significant overlap between survey respondents who rate their mental health as poor and persons who experience severe psychological distress, correct?
A So self-rated health is a -- is it your understanding that that refers to physical health only? Is that what you're saying?
Q I don't know the question on the survey, but my question to you is -- and you're the one that relied on this to refer to --
A Let me answer the question. I presumed that health was not referring to the state of their living or their diabetes or their heart. I thought how healthy are you, and in particular, whatever the

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rating was it says about your -- when they gave the questionnaire -- whether they measured severe psychological distress. So to me they -- one is a self-report subjective estimation about how I'm doing in the world, and who knows about what point of reference that those people had. But here is a more objective answer to a series of questions about psychological distress. I didn't think they were talking about physical health here. I thought they were talking about psychological function and health.
Q And, Doctor, I'm not trying to mislead you. I think you're probably right that they are talking about self-reported mental health. I just was not 100 percent sure, so I did not want to steer you in that direction. But assuming that they are talking about there are two separate questions, one asks for a self-report of your mental health and the other is some measure of your psychological distress, you agree that there's likely to be overlap between persons who report their mental health as poor and persons in severe psychological distress, correct?
A Yes.
Q Okay.

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A But, you see, these are self-report from patients that the investigators don't know, have never met, have no idea --
Q Doctor, I understand that, but you relied on this study for the proposition that over half of the 27,715 subjects in the Almazan study rated their mental health as poor/severe. And my reading of the study is that poor and severe are answers to two entirely different questions, so I am wondering how you came up with that statement that over half of the subjects rated their mental health as poor/severe.
A Didn't I quote that from this study somewhere?
Q You cited the study. You did not quote the study.
A Oh.
Q And in -- I'm on the abstract, but in the results portion of the study, the portion I have highlighted says, "In total, 3,955 respondents reported fair or poor self-rated health, and 7,392 met the criteria for severe psychological distress."
Did I read that correctly?
A I see what you're saying. I see. You think I added those two and said more than half, and you're saying maybe I made a mistake because some of those

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were the same people?
Q What I am saying is that you cite this study as evidence that over half of the subjects rated their mental health as poor/severe, and even when you add those two figures, you don't get up to half of the study subjects.
A I wonder whether I found that in the discussion section.
Q Okay. So you think in the discussion section that there might be different results than in the results section?
A I say I wonder. I don't recall.
Q Okay.
A You need to understand that, you know, I read hundreds of papers, and my memory for each one is not eidetic, you know.
Q Is it possible that there are other portions of your report where you have cited studies for facts that the studies don't indicate to be true?
A Well, that --
MR. CARLISLE: Objection. Argumentative. Misstates his testimony.
A Yeah. That would take, you know, a scholarly review to determine that. I'm telling the truth as I understand it. And, you know, the idea that half

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of these people on a survey rated their mental health as poor, for example, is perfectly consistent with my experience with -- in this for over 50 years.
Q Okay. In paragraph 49 of your report, you described a study authored by Heylens, H-e-y-l-e-n-s, and others. Do you see that?
A Yes.
Q I'm pulling up on your screen what I marked as Exhibit 40, and I would just ask you if you recognize this as the study that you cite.
A It's from 2014?
Q I believe this is 2013.
A Give me a minute. I cited it wrong. I wrote it as 2014. All right. Okay. I presume.
Q And I'm not going to hold you to the specific year, but you recognize this as a study you started describing in paragraph 49, correct?
A Uh-huh.
Q Yes?
A Yes.
Q Okay. And this study, as I understand it, concerns persons who were admitted a symptom checklist called the SCL90 at three points in time, had a presentation after the administration of hormones

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and after affirmation surgery. Is that your understanding?
A Yes.
Q Okay. You understand that the SCL90 is designed to measure a snapshot of a person's mental state, correct?
A Yes.
Q It's designed to tell me how you -- how I'm feeling today, right now, this second, correct?
A And -- yeah. Not this second, no.
Q At the time that I'm asking the questions?
A Okay. Yeah. And the SCL90 did not arise in the context of gender dysphoria. It doesn't have any questions on gender dysphoria, symptoms of gender dysphoria. It originally -- it originated in sexual dysfunction work in general mental health work at a time when there wasn't much emphasis on gender dysphoria.
Q Okay. In paragraph 50 of your report, Doctor, you cite a study that you describe as being by Cardoso and others in 2016. Do you see that?
A Yes.
Q And I will just tell you I think that the citation is proper in your bibliography at the end of your report, but I think you were trying to cite the

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Cardoso Da Silva study that I pulled up as Exhibit 41. Do you see the exhibit?
A Yeah. Are you saying I made a mistake?
Q I'm saying that you made a typographical error. I just want to confirm that what I have on the screen in front you as Exhibit 41 is the same study that you cited as Cardoso, et al., 2016, in paragraph 50 of your report.
A Did it involve 47 patients?
Q I will direct you to the aim portion in the middle of your screen there.
A Yeah. Okay. Yeah.
Q Okay. And my understanding is that this study relied on a quality of life or QOL questionnaire administered by the World Health Organization. Is that your understanding as well?
A Well, yes. I think the questionnaire is known as the World Health Organization Quality of Life.
Q Okay. Thank you. You agree that questionnaire or that assessment does not suffer from the snapshot issue that the SCL90 questionnaire suffers from?
A These are various questionnaires that ask people to -- that are not known to the investigator to estimate how they're doing in life lately, you know. Sometimes they have -- you know, in the last

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year, or sometimes they don't give a time parameter.
Q Let me ask it this way then. I'm sorry. The World Health Organization Quality of Life Questionnaire is designed to measure how I'm doing overall in my life, correct?
A I think so. I would have to look at the specific -- you know, the instructions given to the patient before the questions are asked. They give the -- they give the parameters for the patient to think about.
Q And you agree that this study shows positive psychological and social outcomes associated with affirmation surgery, correct?
A Yes.
Q But it shows a negative influence on physical health and independence. Is that your understanding?
A Yes.
Q And in the middle of the portion that I have highlighted on page 992, the authors indicate that, "These negative results are easily justified by the recovery that all patients underwent during the first year after SRS. The surgical procedure is complex and involved the possibility of surgical

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complications and other esthetic procedures." Did I read that correctly?
A Yes.
Q So the author is attributing the worsening of physical health and independence as resulting from the surgical -- the surgical procedure itself. Is that a fair statement?
A I guess the consequences of surgery, but they can't be sure about that because people on hormones, for example, have lipid abnormalities. They have premature onset of various cardiac, cardiovascular disease, so they -- the surgeons, you know, they just look at things through the light of the surgery, but so many things have went on in the person's life that could result in poor health. This sort of suggests that, boy, there are lots of serious complications to surgery, not what the surgeons call complications in the postoperative time but the long-term consequences of surgery on urination, sexual function, for example, fistula formation, bowel movements, and urinary tract infections.
But there are lots other things going on in a person's life, and so if the surgeon thinks this is all about surgery, that's a kind of limitation of

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understanding about the complex --
Q Doctor, beginning in paragraph 52 of your report, you start describing the fourth outcome parameter, the impact on social and vocational function. Do you see that?
A Yes, I do.
Q You agree that the Cardoso da Silva study found that patients who receive affirmation surgery experience significant improvement in their social relationships?
A By self-report, yes.
Q Okay. In paragraph 52 on the second page, page 27, about two-thirds of the way down, do you see a sentence with "this idea"?
A Two-thirds of the way down?
Q Maybe three-quarters.
A "This idea requires ignoring the studies of the mental health problems of" -- yeah. Okay.
Q Okay. The article -- and this idea, I think, refers to the idea that there are no inherent mental or emotional problems with being transgender. Am I understanding?
A Yes.
Q Okay. And the article you cite to is a 2016 article by Cecilia?

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A Yeah.
Q And others, is that correct?
A Yes.
Q And I have pulled up on your screen what I have marked as Exhibit 42, and you recognize this as the 2016 article that you cite there?
A Yeah.
Q And is this article what I would consider to be a literature review?
A Yeah.
Q It reviewed preexisting studies to determine what it could find out, among other things, the prevalence of psychiatric disorders among transgender persons?
A Yeah. Yes.
Q Thank you. I actually heard you there. I was looking at my notes. And on page 53 of this article the other authors write, "The majority of the psychiatric problems detailed in the studies relate to affective disorders such as depression and anxiety, major psychiatric problems, e.g., schizophrenia and bipolar disorder, were not found any more frequently in trans people than in the general population."
Have I read that correctly?

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A You did.
Q You agree that anxiety and depression can be symptoms of gender dysphoria itself, correct?
A Yes. But they're often present before the diagnosis, years before the diagnosis, or even recognition of gender dysphoria. And in the light of this paragraph, you see, Cecilia and her colleagues are comparing what -- they're leaving the idea out that, oh, just anxiety and depression are minor things, and schizophrenia and bipolar disorder are major things. But there's lots of studies showing that anxiety disorders and depressive disorders that are not bipolar disorders have major consequences for life.
Q You agree, Doctor, that anxiety and depression can be caused by lifestyle factors, events that are more likely to be experienced by transgender persons such as victimization or interpersonal problems, is that fair?
A Well, I know you don't want me to elaborate too much. It's -- your summary is a very limited summary of the complexity of that issue, so I can say it's fair, but I don't really believe that you're capturing the essence in this point of what the issue is.

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Q Well, let me put it this way. You agree that across the board, on average, transgender persons are at greater risk of victimization than non-transgender persons?
A You mean after they come out as transgender? Is that what you mean by victimization, or do you mean they were -- they have a higher level of sexual victimization prior to coming out?
Q I'm going to move on, Doctor. In paragraph 55 of your report, you describe the sixth parameter, all-cause mortality. Do you see that?
A Yes.
Q And you describe several concerns related to all-cause mortality, and the thing you write is while death from suicide after confirmation surgery has received the most attention, the incidence of AIDS, cardiovascular disease, and cancer is also significantly elevated. Do you see that?
A Yes.
Q And in this paragraph, you cite various studies by Jackson, by Erlangsen, by Cecilia, and by De Blok as well as a database maintained by the United States Veterans Health Administration, is that correct?
A Correct.

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Q It's my understanding from looking at these that all of these studies and the database were comparing various events following gender confirmation surgery to the general population as a whole, is that correct?
A Not quite. The VA Hospital data -- just, I mean, these are massive data studies, you know, with hundreds of thousands of, quote, cases. And so anybody registered under the term transgender or gender dysphoria, anything in transvestism, for example, anything that sounded like it could be gender dysphoria in today's diagnosis, they were included whether or not they had surgery.
Q All right. And was that just the VA database you were describing there?
A No. Actually, I would have to look at each individual study to see the specific criteria. Of course, the 2011 study by Cecilia and her colleagues were only the people that had sex reassignment surgery, but I think most of these are called registry studies using, you know, massive databanks, national databanks, where everyone who has a diagnosis gets, you know, put into the databank, the central databank. I would have to look at the individual studies about which ones had

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surgery and which ones didn't have surgery. They all had to have a diagnosis. It's not necessarily of surgery, I think.
Q But regardless of the population they were studying, the control group for all of these was the general population, correct?
A Exactly.
Q It's fair to say that none of them were measuring persons' post gender affirmation surgery versus persons who never received gender affirmation surgery, correct?
A One of them was -- the 2011 study did that.
Q Okay. That's the only one?
A I'm actually not certain. You know, these are five different studies, and I'm not certain the answer to your question.
Q Okay. And we already looked at the 2011 Cecilia study, and you agree that that was comparing persons who had received affirmation surgery to the general population, correct?
A You know, the general impression here is that because of the multiple things going on in the lives of trans people, whether or not they had surgery, they are vulnerable to many problems including overdose, you know, dying accidentally.

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Q I'm sorry, Doctor. Was the answer to my question yes? I was just asking who the control group was for that study. The general population, correct?
A Yes, exactly right. Yes, you're exactly right.
Q Okay. The sentence from your report that I read to you begins while death from suicide after GCS, gender confirmation surgery, has received the most attention -- and goes on from there -- it sounds to me like you were telling me now that some of the studies that you cited might not have even been specific to gender confirmation surgery?
A Yes. I'm not sure that they're specific for that. I think they're specific for entering into a national database a transgender identity, a transgender diagnosis, and that could be gender dysphoria or gender incongruence or gender dysphoria. Gender dysphoria can be gender dysphoria non-specified.
Q The only study that you cite in this paragraph that you're aware concerns specifically persons who received surgery is the Cecilia study from 2011, correct?
A At this point, that's what I am aware of, yeah.
Q Okay. In paragraph 69 of your report, scooting on forward a bit -- let me know when you're there.

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A I'm here. I'm there.
Q You describe in this paragraph a medical review conducted by the United States Department of Health and Human Services, correct?
A Yes.
Q It's my understanding that what you're describing is known as a national coverage determination applicable to Medicare coverage?
A Yes.
Q And it's my understanding that the determination in 2016 was essentially not to issue a national determination saying that Medicare will always cover gender affirmation surgery, correct?
A I'm not so sure it doesn't apply to Medicaid as well, but it was done by the offices of Medicare, yeah.
Q But the decision itself was to leave it up to local agencies to approve coverage for confirmation surgery on a case-by-case basis when it was deemed to be medically necessary, is that correct?
A I thought it was leaving it up to individual states and their policy making rather than individuals.
Q Okay. And I said local agencies, and they might have been statewide agencies, but it was -- the determination was to leave it up to someone at the

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local level to decide whether to approve Medicare coverage for affirmation surgeries on a case-by-case basis when medically necessary, correct?
A Yes, case by case.
MR. ROSE: I am sorry, Alex. Off the record real quick.
(A discussion was held off the record.)
Q Okay. Doctor, in paragraph 59 of --
A 59?
Q 59. I'm sorry. Of your report, you begin that paragraph by saying that state prison systems' policies about trans inmates vary and evolve at different rates. Do you see that?
A Wait. No. I haven't found it yet.
Q Sorry. It's on page 31.
A Okay. I see it now, yeah.
Q Okay. Are you aware of state prison systems that provide confirmation surgery for inmates when it's deemed to be medically necessary?
A Yes.
Q Which states are you aware of that will?
A Massachusetts, California. I have a feeling Illinois, maybe, and New Jersey. That's the extent of kind of the confidence in my answer.

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Q I assume it's possible that there are other states out there that will provide it that you're not aware of?
A That's right.
Q And the Massachusetts policy will allow for confirmation surgery when it's deemed to be medically necessary?
A Yes.
Q And I assume that you played a role in drafting that policy?
A No.
Q Did you approve it?
A I didn't have to approve it. I was informed about the policy.
Q Okay. Okay. I will pull up on your screen what I have marked as Exhibit 43. Sorry. I don't want to show you my entire inbox. Let me stop the share real quick. Okay. I'm sorry. It was -- I didn't think any of my exhibits were large enough to cause an issue. Okay. Doctor, do you see what I have marked as Exhibit 43 on your screen there?
A Yes.
Q Okay. I will represent to you that this is the Transgender Offender Manual that has been released by the United States Department of Justice Federal

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Bureau of Prisons. Are you familiar with this document? Have you seen it before?
A Never.
Q Have you ever been made aware of the policy of the Federal Bureau of Prisons regarding coverage or provision of gender-confirmation surgery?
A This would cover all states.
Q This just covers persons incarcerated by the federal government within the Federal Bureau Of prisons.
A I don't think I am aware of this at all.
Q Okay. That makes my questions on this far shorter. Are you familiar with the National Commission on Correctional Healthcare, or the NCCHC?
A No.
Q You're not aware that it exists?
A I may have heard the term, but, you know, I don't -- I'm only a consultant to Massachusetts. You know, I don't -- I have not been invited to go to the national meetings of corrections care and so forth. And I generally am -- I'm not immersed in the policy, federal or state policy or prison policies. Sometimes someone -- I mean, I hear about, you know, what is required now, but I don't know the -- you know, I don't know this document,

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or I'm not greatly familiar with the other document you just mentioned.
Q I believe -- I'm sorry. Every time I scroll up, I miss -- something comes up that prevents my ability to click over to something else. Let me go ahead and just try to see if the -- there we go. I will scroll over to what I have marked as Exhibit 44, which I will represent is a position statement released by the NCCHC, and I will ask you if you have ever seen this document before.
A I have not.
Q Okay. In your consulting work for the Massachusetts Department of Correction or for other correctional agencies, have you ever consulted any statements or guidance issued by the NCCHC?
A Well, those initials aren't familiar to me. I think in Massachusetts once they -- when they revised their policies, they -- I have to read them. I have to read them, but I don't know this -- this doesn't look familiar at all to me.
Q Okay. That is perfectly fair. Hold on just one second. Doctor, this is entirely my fault. My notes reflect an incorrect citation to a portion of your report, so I'm trying to find the right portion to direct you to, and I apologize for the

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delay.
A I graciously accept your apology.
Q Okay. I'm sorry. It's paragraph 71. I'm so sorry. I wrote paragraph 37, page 37.
A I'm on page 37, paragraph 71.
Q Okay. Okay. The very last sentence of that page -- of that -- on page 37, at least, says, "What others have written about the special challenges of this prison population were ignored." Do you see that? I'm sorry, Doctor. Do you see that in your report?
A Yes.
Q Okay. I'm sorry. And the citations you offer which span pages 37 and 38 are to a piece that you wrote and to a piece that Osborne and Lawrence wrote, correct?
A Yes.
Q And I have pulled up on the screen Exhibit -- what I have marked as Exhibit 45. Do you see that okay?
A "Male Prison Inmates with Gender Dysphoria. When is Sex Reassignment Appropriate?" Yes.
Q And my question to you is, is this the Osborne and Lawrence article that you cited in --
A Yes.
Q -- paragraph 71? Yes.

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A Yes.
Q Okay.
A I interrupted you. I'm sorry.
Q You're perfectly fine. Doctor, the other citation you offered too was a piece that you published in 2016, correct?
A Yes.
Q And that is to a piece titled, quote, unquote, "Reflections on the legal battles over prisoners with gender dysphoria"?
A Yes.
Q I'm correct that is commentary, not original research, correct?
A Yes. It's reflections on my role in the various lawsuits and then with -- yes, it's correct.
Q And it's my understanding that portions of your expert report in this case have been taken largely verbatim from this commentary piece that you wrote in 2016. Is that a fair statement?
A I don't think so. If I'm aware -- I'm not aware that I lifted verbatim from --
Q Okay.
A No. Actually, I don't think that's true at all.
Q Okay. You're not in trouble if you quote from yourself, just for the record. Okay. Doctor, you

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understand that this lawsuit was brought on behalf of an inmate who -- whose preferred name is Autumn Cordellione, correct?
A Would you pronounce that last name slowly? Because I want to hear how that word -- that name is said.
Q I have always said Cordellione, and I have not been corrected yet about that.
A Cordel --
Q Cordellione.
A Cordellione.
Q Okay. All right. But there's a chance that she's just polite, and I'm not pronouncing it correct at all.
A Okay. And there's a -- you know, this may be like the Dhejne name. We may refer to her as Autumn because it's easier.
Q Why don't we do that. Doctor, have you ever met Autumn?
A Never.
Q Have you ever spoken with her?
A No.
Q Have you ever conducted any sort of mental health evaluation on her?
A No.
Q Have you spoken with any of her medical or mental

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health providers about her?
A No. The closest of meeting her is I watched a videotape of her, but I never met her personally. When you said that word, "met," I thought you meant in person.
Q And that was a videotape that was taken as part of her medical experience at the facility?
A Well, it was about a PREA.
Q I'm sorry. I'm sorry. That was a videotape concerning her PREA report that she had, a PREA complaint that she had made?
A Yes.
Q Okay. And do you know how long ago that was taken?
A I think it was the summer, but it was about an incident years before.
Q Okay. Other than this video, is it fair to say that the only material that you have reviewed specific to Autumn are her institutional medical records?
A Yes.
Q Do you agree that inmates in general may withhold information from medical and mental health staff at the facility?
A Oh, yes.
Q And I think you even note in your report that male

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inmates are generally unable to trust their assigned mental health professionals?
A Yes.
Q And I assume that was referring to male transgender inmates or transgender women?
A Yes.
Q And my assumption is that that's even more likely when it comes to discussing gender-related issues or gender dysphoria?
A No. It's related to eroticism, sexual behavior, past life experiences, adversities experienced, sexual behaviors in -- before prison and outside of prison. These generally require a great deal of trust, and there are many reasons why inmates don't want to discuss these things.
Q Is it your understanding that transgender women in particular might be concerned about abuse or harassment by staff or other inmates if their gender identity becomes known?
A Yes, especially we could expand the word harassment, you know.
Q Sure. And do you agree that inmates will often withhold from staff information pertaining to suicidal ideation or self-harming behavior?
A It depends on the -- on the inmate.

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Q Well, is it your understanding that inmates will sometimes withhold information in order to avoid placement in a suicide cell or a padded cell?
A Well, if they had experience in the past with that kind of response to having a suicide watch, they may be hesitant to repeat it if they experience that as adverse, but, you know, when we talk about inmates, it's sort of like talking about Catholics or men or, you know -- you and I both recognize there's considerable individual variation and that label we apply to a demographic group, so it's hard for me to say yes or no to such questions.
Q Okay. Doctor, are you familiar with the Code of Ethics published by the American Psychiatric Association?
A Various iterations, yes.
Q And do you follow this ethical code in your practice?
A I hope so.
Q Okay. And you're still a member of the APA, correct?
A Member of the what?
Q Of the American Psychiatric Association?
A Yes.
Q I assume you have been a member since the '70s?

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A Yes. I'm what's called a distinguished fellow of the American Psychiatric Association.
Q I'm pulling up for you what I have marked Exhibit 46. Do you see that?
A Yes.
Q And you recognize this as the ethical codes published by the APA?
A Yes.
Q Are you familiar with what was known as the Goldwater rule?
A The Gold -- I'm sorry. The Goldwater rule?
Q What is colloquially known as the Goldwater rule?
A Yes.
Q And I'm going to scroll down to page 9 of the ethical code where I highlighted a portion that says, "It is unethical for a psychiatrist to offer a professional opinion unless he or she has conducted an examination and has been granted proper authorization for such statement."
Did I read that correctly?
A Yes.
Q And, again, you have never examined Autumn, correct?
A I examined medical records, and the examination of medical records, I think, is very common in

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consultative work in psychiatry. You know, the Goldwater rule had to do with Barry Goldwater and -- presidential candidate -- and recently the Goldwater rule since the era of Mr. Trump has been seriously questioned and challenged, actually, but in -- forget politics for a minute because that's where the Goldwater rule came from. There are countless psychiatric consultations that are done primarily on medical records, and I supervise people and help them with handling their cases. And I have never seen the patient itself, and the whole psychiatric education process involves a supervisor, more experienced person, never meeting the patient and giving advice on the treatment, appropriateness for treatment 1 versus treatment 2. So, you know, we have to understand the sentence in a larger context.
Q Okay. Doctor, I know this is mentioned on your CV, but do you recall serving as an expert witness in a California case called Norsworthy versus Beard?
A Norsworthy, yes.
Q And this was a case where Ms. Norsworthy sued the prison alleging that it violated her rights by refusing to provide gender confirmation surgery?
A Yes.

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Q And you submitted an expert declaration in that case?
A Yes.
Q I'll pull up what's marked as Exhibit 47, and I will just represent to you that this is a copy of the district court's decision in that case on the plaintiff's request for a preliminary injunction. My first question to you is it might not have been in this form, but have you ever seen a copy of the district court's decision on the plaintiff's motion for preliminary injunction in that case?
A No. But I heard about some aspect of it.
Q I'm going to scroll down to page 12 where the district court writes, referring to you, he states, quote, I know of only one inmate in the U.S. who has had SRS while in custody. This California inmate's mental health dramatically deteriorated, closed quote. Defendants have conceded, however, that the incident Levine describes could not have occurred because no vaginoplasties have ever been performed on an inmate incarcerated in California.
Do you see where the district court writes that?
A Yes.
Q Are you aware of the concession in that case made

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by the California correctional department indicating that they had never performed vaginoplasties on an inmate in their custody?
A If you're going to cut me short, you won't get the facts in this case.
Q I'm not asking for the facts. I'm asking if you're aware that the California Department of Correction conceded they had never performed a vaginoplasty on an inmate. Are you aware of that?
A That's because it was performed in Texas.
Q Okay.
A And the patient was transferred to California.
Q Okay. Are you aware that the judge in that case later referenced to you as relying on a, quote, unquote, fabricated anecdote?
A And you need to understand that the judge was wrong, that I made reference to a case that I actually have in written possession at my home of a -- I gave a six-hour workshop to California DOC mental health professionals, the last hour of which they presented a case, and they gave me a written report of this case. That's what I was referring to. The judge never talked to me. He made his conclusions imputing my integrity saying I fabricated it. He's wrong, and usually people who

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are deposing me bring this up. And this has been -- I mean, if you need me to, I can provide quite extensive documentation that the judge was in error about this, and he's just wrong about this. When he said I fabricated it, he was wrong. He never questioned me. He just concluded this. He didn't see me in court because I was never in court.
Q Okay.
A So, you know, this continues to be, oh, that Levine has no integrity kind of implication. He's a fabricator. He's a liar. I'm not. He's just wrong.
Q Doctor, do you recall serving as an expert in a Connecticut case called Clark versus Quiros?
A Uh-huh.
Q Yes?
A Yes.
Q And this is the one that we discussed at the outset that was not on your CV, correct?
A Yes.
Q And this case also concerned whether a prison system violated a transgender inmate's rights by not providing confirmation surgery, is that correct?

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A The actual legal issue has not been foremost in my mind. It's a legal concern. I was asked to do a psychiatric evaluation of this prisoner. I gave a psychiatric evaluation. I gave a set of --
Q Doctor, if you're not aware what the legal claims were in the case, you can just tell me. That's a perfectly fair answer.
A In a profound sense, I'm not aware.
Q But you recall that your deposition was taken in that case?
A Yes.
Q And you also submitted an expert declaration?
A Yes.
Q Do you recall that in that case you outlined a pathway to further consideration of the possibility of some genital surgery in the future?
A That was my memory, yes. That was exactly my memory because in one of the reports that -- one of the versions of the expert opinion reports -- that's what I said. I said, here is a pathway. I made recommendations for the DOC about how to deal with this prisoner and how to reassess the prisoner for sex reassignment surgery in the future after these situations were removed. And during --
Q I'm sorry, Doctor. You answered the question. The

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pathway that you outlined for Ms. Clark involved her meeting regularly with two different types of therapists, one of them specific to her gender dysphoria?
A I think -- I think the answer to that question is yes.
Q And I think you said she should meet with one of these therapists at least once every two to three weeks?
A I think there was a recommendation that she would have a regular, reasonably frequent for a prison system to discuss her life, her concerns, her motivations, and her general mental health. And then I think the second one was somebody to evaluate the persistence of and the intensity and the criteria for gender dysphoria.
Q And I assume that the second person would need to be someone who was adequately trained and experienced in gender-related issues?
A Somebody who is knowledgeable about this issue, yes.
Q Okay. Do you have an understanding as to how frequently Autumn is being seen by her mental health professionals?
A I'm sorry. Repeat that, please.

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Q Do you have an understanding how frequently Autumn is being seen by her mental health professionals?
A Oh, Autumn. We're off of Clark now, right?
Q Yes. I'm sorry.
A I'm sorry. I was still -- I think she's offered regular treatment. Of course, over the years she's had numerous treatments, numerous -- she's been in numerous institutions and I think has always had psychotherapeutic support.
Q And when you say she's offered regular treatment, about how frequently do you believe that she's seen by a mental health professional?
A I would think at least once a month.
Q And do you have an understanding of the training or experience in gender-related issues of her mental health staff at the facility?
A Well, we're talking about a large number of people, and so I certainly couldn't have an understanding of their -- of their understanding and their education or their training in gender dysphoria. This whole issue of training in gender dysphoria is a profoundly controversial area, and I just will leave it at that.
Q Back to the Clark case, do you recall testifying in your deposition that you are unable to make the

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professional opinion as to whether Ms. Clark was a candidate for confirmation surgery because you had not seen her in 22 months?
A I don't recall, but that would be something that I could see myself saying that -- that I had outlined, you know -- as you established, I had outlined a kind of pathway to reevaluation, and that whole case was so delayed so that almost two years later they asked me the questions so -- and I didn't know what happened to Ms. Clark in the last 22 months.
Q What is it that makes you feel comfortable rendering an opinion as to whether Autumn is a candidate for confirmation surgery when you have never seen her if you could not make that determination for Ms. Clark because you had not seen her in 22 months?
A Did I state that there is -- that this person should not have sex reassignment surgery in my report?
Q Do you believe that Autumn should have a pathway available to potentially obtain confirmation surgery in the future?
A I would say that any long-term inmate who identifies as transgender and who thinks that

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gender confirmation surgery is desirable for her ought to have a pathway to a psychotherapeutic, conversational trusted -- with a trusted person -- pathway over time to think about this question and to recognize her own ambivalence so that when -- so that she can, in fact, consider multiple things including her background and in this particular case her masochism, her self-hatred, her continued difficulties in interpersonal relationships, and so that I think that a -- that almost everybody deserves an opportunity to think about this over time, over a long period of time, with a trusted person when they can get at the forces, the motivations, for their wish for surgery, their hope for benefits, and their knowledge of the potential harms and the possibility that science would dictate that not everybody achieves their benefits, the desired benefits. So that is a pathway, and in that sense, my answer to your question is yes.
Q Do you understand that the Indiana statute that we have challenged in this case makes that pathway unavailable for transgender inmates within the Indiana Department of Correction?
A Yes. I now understand that, but the path -- what --

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Q That's all I wanted to ask, Doctor. Thank you.
A It's not quite accurate, though.
Q Okay. I am just about done with asking my questions, I think. If it's okay with you, Doctor, I would like to take a break, maybe ten minutes or so to speak with my cocounsel.
And, Alex, I really think I'm very close to done if you want longer to speak with Dr. Levine or anything.
MR. CARLISLE: Okay.
(A discussion was held off the record, and a brief recess was taken.)
Q Doctor, despite the fact that my cocounsel has temporarily left the room and is now back, I have just two very quick follow-up items for you. The first, the Texas inmate that you testified about in the Norsworthy case, the California case, do you recall that inmate's name?
A I was never given a name. I have probably initials. I want you to know that --
Q And I'm sorry, Doctor. You answered the question. Who gave you that inmate's initials?
A The person who presented the case to me gave me a sheeted -- a printed sheet, rather, with the elements of the presentation. I happen to -- for

reasons I don't understand, I happened to have saved that and spoke -- it's always funny to me that the judge said that I fabricated this, and I have in my possession the basis for which I wrote in that case.

Q And you indicated that the individual had received gender affirmation surgery while incarcerated in Texas? Do I have that right?

A It was my understanding that -- maybe there was some confusion here about vaginoplasty. It was my understanding that this person was in prison for one reason in Texas and had castrated himself. He took off one testis, and he was sent to the hospital, and the naive surgeon heard that he did this for this reason, and he said, let's just finish the job. And so then they took off -- they took both. They took the other testis off.

Q Okay. So you don't even know if that person carried a diagnosis of gender dysphoria?

A Well, the patient said that he had gender dysphoria, you know.

Q But you don't know if they carried the formal diagnosis?

A Look, if you want to go downstairs and pull out the form --

Q I just want to know as you sit here today, do you know if that person had a formal diagnosis of gender dysphoria?

A Well, the -- when the person was transferred to the California institution because the person was known to -- I think had gender dysphoria and had this operation -- I don't know whether they did a vaginoplasty or not. At this moment, I don't know. But the person was housed in the female prison, and that's why they were consulting me because the patient said that she/he didn't know who he was, whether he was a man or a woman and was a behavioral disturbance, and nothing that the mental health professionals had done had calmed this person down. And so it was presenting to the great expert, Dr. Levine, who was coming from California -- coming from Ohio to tell them what to do with this case.

Q Were you consulted by Texas officials or by California?

A No. No. This was only in Sacramento. This is only for one hour. This whole problem started because I mentioned this in the Norsworthy expert opinion report.

Q Okay.

A That I wasn't sure that, you know, these people will live happily ever after, and that was my, quote, fabrication.

Q Okay. I am sharing with you what I have marked as Exhibit 48. Do you see that on your screen right here?

A Yes.

Q At the beginning of your deposition, Doctor, you had mentioned that in the lead up to today's deposition you had read an article by Van der Sluis?

A Yes, this is the one.

Q And others. Is that the article?

A And what?

Q I said Van der Sluis and others?

A Yes. Yes.

Q This is the article that you reviewed in advance of today's deposition?

A Yes.

MR. ROSE: Okay. I have nothing further. Thank you very much for your time, Doctor.

MR. CARLISLE: Gavin, I think that should be 49.

MR. ROSE: Alex, I sent you 48, but I never used it, so you can discard it, or I was trying to

make it so we did not have gaps in our numbering.

MR. CARLISLE: Okay. So can you send me the new 48 then?

MR. ROSE: Yeah. I'm so sorry. We just pulled this during the deposition.

MR. CARLISLE: Okay. Perfect.

CROSS-EXAMINATION

BY MR. CARLISLE:

Q Dr. Levine, how are you doing?

A I'm pretty good.

Q Good.

A It's 2:00.

Q It's 2:00 so we'll --

A I'm a little fatigued. I'm fine.

Q All right. Doctor, I want to start with earlier when you were talking with Mr. Rose you were discussing the clinician's role in determining whether the patient is telling the truth before you were cut off. Do you recall that?

A Yes.

Q What did you want to say before you were cut off?

A I wanted to say that in our -- in the international group's involvement in transgender care which largely decide who should have surgery and who should not, we encounter -- we had, in our

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professional understanding of the differential diagnosis of someone who was requesting hormones and surgery, we had this concept of the true transsexual. The true transsexual is a term derived from Harry Benjamin, who is the father of this whole field. In 1966 he thought he could distinguish varieties of people who should have and shouldn't have surgery, and he called a couple groups of people true transsexuals. But, we, listening to Dr. Benjamin, we believed that there were true transsexuals, that is, people who should have and would automatically benefit from surgery. We kept that concept going for about 15 years. The trouble is that we discovered during the course of our work in the '70s and '80s is that many of the people sounded alike in their history, and they sounded just like Harry Benjamin's descriptions. They sounded just like the early chapters in psychiatric textbooks about transsexualism.

And we came to realize based upon confrontation with these patients and then confessions that they were lying about their history. Their history was, in fact, much more variable from one person to another, and this homogenous background was, in fact, false. And so

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we stopped using the term "true transsexual," and so that's what I wanted to explain, the reason why it's not just making the diagnosis in the psychiatric evaluation. It is to make an assessment about the veracity of what we are told, so sometimes we want to get records from the community. Sometimes we want to talk to the parents. We often want to talk to the parents, and we want -- if there's a wife involved, we want to talk to the wife. So it's not simply like the diagnosis exists, and therefore the treatment has to be given of X, Y, and Z, but their responsibility, the evaluator's responsibility, is to judge over time and not just one time, you see, to judge over time the veracity of the history and how much does that change over time. And it often does change over time, and that's why we think a comprehensive psychiatric evaluation cannot be done in an hour or two hours. It has to be extended over time. That's what I tried to say.

Q Okay. In paragraph 44 of your complaint, do you recall discussing the 75 percent figure from the Littman article?

A Yes. I was extrapolating. The 75 percent actually should have been 76 percent from her statement that

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only 24 percent of people went back to the original provider to tell them that they think they should transition, unfortunately. That was the source of the 75 percent. I should have said 24 percent returned in at least the study of 100 people.

Q All right. But that figure -- (inaudible)

A I'm sorry. That got jumbled.

Q Earlier you and Mr. Rose were talking about Exhibit --

MR. ROSE: Alex, I'm sorry. You have a bad connection or something. You're really choppy.

MR. CARLISLE: Let me try turning my video off.

MR. ROSE: That's much better.

MR. CARLISLE: Better with the video off?

MR. ROSE: Yeah.

MR. CARLISLE: Okay.

Q Sorry about that. Dr. Levine, earlier you were talking with Mr. Rose about Exhibit 37, the Cecilia article. Do you recall that?

A Yes.

Q You began to discuss why she was courageous, the author of that article. Can you explain what you wanted to say before you were cut off?

A Yes. To me and many other people, this was a key

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article of breakthrough history of trans care. You see, in 1993 was the first presentation of a review of a large number of surgical -- the results of a large number of surgical experiences primarily Europe, and there was a 70 percent loss to follow-up rate, but nonetheless, the Faflin and Yungi (phonetic) concluded that surgery was an effective treatment, and there was no control, and the idea that you lost 70 percent to follow-up, you didn't know what happened to them, and then you made this conclusion that among the 30 percent, the patients generally without any particular measurement because there wasn't that kind of stuff back in the '80s and '90s, that sex reassignment surgery was really a good treatment.

So along comes, almost 20 years later, Cecilia and colleagues' study, and the study was of everyone who has sex reassignment surgery, and the data was not on self-report. The data was on the -- from the national databanks for criminality, for death, for psychiatric hospitalizations, for cancer incidents, and for suicides -- and for suicide and for suicide attempts. So in 2011, she presents this study, and it's free access, so anyone -- there's no pay wall. Anyone can read it

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who was interested in the study. And it was really impressive that we had data, not subjective data but objective data on these many parameters, and she showed a ten-year graph about the death rate of various people who had sex reassignment surgery, right, and then she gave the causes for it, although she didn't use AIDS as a cause, interestingly enough. And so she showed that there was not only elevated suicide rate that Mr. Rose was asking me about, but there was elevated death rates, in general. There was elevated suicide attempt rates and elevated arrest rates. What I want to emphasize is that Cecilia and colleagues recommended in that article that these people after sex reassignment surgery, which, remember for the last 20 years was thought to be a cure of the problem, she recommended life-long psychiatric care after gender -- sex reassignment surgery, see. So this was just an amazing development in the scientific world of trans care, an ideal 30-year-follow-up study, you know, and with data that's objective. She presented this paper at the WPATH meeting, and the following year the 7th Standards of Care came out and didn't even mention this study. And so what we have here is an

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introduction to the fact that the people who were promulgating and advocating sex reassignment surgery for people weren't paying attention to Cecilia and her crew. And so that's why it's a major study, and that's why I think all of us need to take our hats off to Cecilia and her group and to recognize despite what she might have said, don't interfere with sex reassignment surgery. Don't think this study shows what I think it shows, right? I think we all need to understand what's in the study. So when I educate people about transgender care, I have them read this study. See, it's not what Dr. Levine says. It's what the study shows.

So that's what I was cut off from saying, my great respect for Cecilia and her work, you see, and my disagreement about what that study meant in terms of caution. And, I mean, everyone has ignored her recommendations that these people have life-long psychiatric care afterwards. And so when I hear somebody saying, oh, this is a cure for gender dysphoria, I think, well, they didn't read the study, or they didn't remember what Cecilia and her colleagues said, life-long care. That means that they were mentally -- they're still not

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mentally well, and they need more help than surgery can provide. That's what I wanted to say to Mr. Rose.

Q Very good.

A If he allowed me.

Q Dr. Levine, before our last break, you and Mr. Rose were talking about a pathway, and you indicated you weren't done speaking. What did you want to discuss before you were cut off about the pathway?

A I thought Mr. Rose was saying pathway meant that there should be sex reassignment surgery given to prisoners, and my concept of a pathway is different than his concept. My concept of a pathway towards sex reassignment surgery would be that if we knew someone wanted sex reassignment surgery who had this diagnosis, that we would enter into a process of talking over time, hopefully gaining the trust of the person, to review the motives for sex reassignment surgery, why they're in such distress, and why do they think the surgery will fix their distress when they only have genital dysphonia, for example, and that we need to think about what their hope for benefits are from the surgery and what the harms that they know about could come from it. And we need to teach them about what the state of

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science is about this, you see, and we need to recognize that for Autumn, who's going to get out of prison one day, that this preparation while in prison is a pathway towards the eventual decision outside of prison to have or not to have sex reassignment, genital vaginoplasty. So the pathway is, to me, it's a psychological process that requires a trusted relationship to discuss a number of things to meet the legal criteria of informed consent. And, you know, when someone is involved in a lawsuit, they have to represent themselves as they have no ambivalence, but I can tell you as I have told many, many people, transsexual people are first human beings, and human beings are ambivalent about most major things in their life, but they don't necessarily represent their ambivalence.

When I talk about a pathway with a trusted relationship to a therapist, it's the therapist is going to teach this person that it's okay to be ambivalent. You can be worried about this. You could be frightened about this. You can have a panic attack about this and still decide in the future to have this surgery, but you need to understand what the anxiety, what the panic is about, you see. And we doctors can't tell you

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because we don't have the scientific basis to tell you don't worry, dear, this will be fine. We can't say that, and we shouldn't be necessarily deliberately recommending surgery to people that we don't know in this way that you can only know in a pathway towards. A pathway doesn't mean that you're going to get there or that you actually will want to get there when you can get there, and so I think Mr. Rose was using the term pathway as a direct road to the operating table, whereas I think the pathway is the psychological process of thinking about one's life and one's future and trying to be realistic based upon science and based upon my desire and in understanding of the motivation for my desire because, see, people who are transgender or who meet the criteria for gender dysphoria have long been gender dysphoric. They have long been uncomfortable with their body, and suddenly relatively recently they suddenly want surgery.

And I want to know how you got from being comfortable taking hormones, you see, and feeling better about yourself and what is causing you to think this is the next step, and are you being manipulated by some legal process, you know, that

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makes you say I have no ambivalence. That's what I wanted.

Q Thank you. Sir, given the state of science, is there a debate within the medical community that surgery -- as to whether surgery is a necessary or effective treatment option?

A There's considerable debate. You see, WPATH wants everyone to realize that -- wants everyone to think medical professionals agree that this is the right thing to do for these patients. But when I mentioned those two studies, the Branstrom, Pachankis, and Almazan and Keuroghlian study, what I wanted to emphasize, that these four people who are known from other publications to be staunch advocates for sex reassignment surgery, they said in the introduction to each of their respected papers that it's not clear what the mental health benefits of sex reassignment surgery are, or in this case, we talk about vaginoplasty.

But it's not clear what the mental health long-term benefits are. Now, these are not coming from skeptics. These are coming from advocates, so they undertook this study to prove that there was benefit. And, see, the Almazan study -- and Almazan is a medical student, I think -- the

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Almazan study showed that there was no change -- that there was a decrease in suicidal ideation, but there was no change in suicide attempts, so to me these are kind of incongruent ideas. But the most important thing is not that study because that study has a long history of these -- this 227,000 people. Many very cogent methodologists have reviewed and trashed any of the studies that come from that population. It's the Branstrom and Pachankis study that we should talk about, you see, because they concluded that sex reassignment surgery had mental health benefits. They published that study online, I think, in December 2019, and immediately upon publication there were seven letters written to the editor by a total of 12 authors, and the editor is Ned Kalin from The American Journal of Psychiatry, and Dr. Kalin read these letters and decided to send that study out to two separate statisticians, methodologists. And because the seven letters to the editor says this is junk, the conclusions are not based on the data that is presented, and, in fact, one or two people suggested that the authors were being consciously dishonest.

The two independent scientists who looked at

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this independently concluded that the data did not support the conclusions. Dr. Kalin then decided -- he wrote to the authors, and he said you must publish a retraction. So what I think -- so a little background for this. When a journal receives a paper, like The American Journal of Psychiatry received this paper, usually the editor sends it out to three different reviewers, and they must have read this article, and they said that you should publish this article, right? Then what happened happened, what I just described. You see, so what happened is that then the -- when this was published in print -- and that would be August of 2020 -- Dr. Kalin then wrote an editorial about what he did and what his concerns had been, and then he talked about the two statisticians. And he published the 7 letters by 12 authors, and he published the retraction of the conclusions by Branstrom and Pachankis, and what they agreed to is that more research is necessary to determine the mental health benefits of sex reassignment surgery and that they agree that their study did not answer all the questions that they thought it answered.

And so I tell you this long -- these multiple paragraphs I just uttered to say to you there are

doctors who are skeptical about this and doctors who are believers about this. And the state of science is uncertain. That's, of course, what the Medicare review in 2016 said and that, I think, prudent, intelligent, thoughtful people can disagree.

Now, in medicine, disagreement is common, and we use disagreement to articulate further studies, to design further studies to settle the controversy. In this field, we don't do -- we don't settle our arguments. We just sort of hate each other. We sort of have animus for one another. We select studies, so this state of disagreement here is so unlike any other medical issue, you see, and it should alert all of us there's something strange going on here where science is not respected by people. I think that's what I wanted to tell Mr. Rose.

Q Very good. Given the state of science you just described, are there treatment options for gender dysphoria currently available within the Indiana Department of Correction sufficient to treat prisoners with gender dysphoria even if surgery is not an option?

A As far as I understand, IDOC recognizes that this

is a particular psychiatric disorder and that it has accommodations that can be done to ease the pain and suffering and distress of people. And, you know, those are the things that WPATH has written about in SOC8, that is, that we should address them as they wish to be addressed with pronouns of her, you know, and if I say my name is Autumn, call me Autumn. They're called Autumn, right? They get the showers separately. They get female canteen items. They get evaluated and can obtain estrogen treatment, estrogen and puberty blockers, spironolactone. And they're generally accommodated very nicely to this, and hopefully all the things that they want make them temporarily feel better, you see.

So given the uncertainty about sex reassignment surgery having additional long-term, lasting benefits that prevent suicide and prevent depression and despair, you see, and given the politics that determine whatever state legislatures decide or the DOC decide, I think Indiana DOC is indicating that they recognize gender dysphoria as a problem. They recognize there's some things to do to make these chronically disturbed people -- many of them chronically disturbed people -- a

little more comfortable. And I think they make this a policy. And does that mean it cures all their distress about living in their body and living with their adversities and their crimes and so forth? No. But I think Indiana is trying to do something to help them, you see, within the limitations of the law, within the limitations of medical uncertainty. You see, even the fact whether hormones really improves males with gender dysphoria has not been adequately proven. It's just the fashion to do it, but the fashion of giving hormones which can be stopped and the body can -- at least the male body can return to some male function, is different than having a surgery that you can't reverse, you see, so I think that's one of the reasons why these DOCs easily provides hormones these days but don't easily provide sex reassignment genital surgery because of the irreversibility and the -- of the procedure. And the recognized -- the recognized vulnerabilities of these people because, you know, they have borderline personality disorder. They have self-harming behaviors. They are sociopathic. These are -- all these are indications that I don't cope well with life, with my feelings, and my

dilemmas, so I think the DOC is trying to treat these people, including Autumn. I don't think they're indifferent to Autumn's pain.

MR. CARLISLE: Very good. Thank you, Dr. Levine. That's all the questions I have.

REDIRECT EXAMINATION

BY MR. ROSE:

Q Doctor, I just have one very quick follow-up. Both with me initially and then with Alex you were discussing what we called a pathway to, however you want to phrase it, to gender-confirming surgery, to consideration for gender-confirming surgery. I don't want to -- I don't want anyone to get bogged down in semantics. In your estimation, in the appropriate patient, is it possible that this pathway could eventually lead to the provision of gender confirmation surgery for prisoners?

A For prisoners? Well, the answer is potentially yes.

MR. ROSE: Okay. Thank you. I have nothing further.

RECROSS-EXAMINATION

BY MR. CARLISLE:

Q Was there anything you wanted to add on that before we end today?

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A Are you talking to me? Anything I wanted to add?
MR. ROSE: I'm going to object. That's not a proper question.
Q Were you done speaking?
A I'm sorry. I didn't quite understand. Were you asking me, Alex?
Q Yes, Dr. Levine. Were you done speaking?
MR. ROSE: Sorry, Alex. I asked a yes or no question and got an answer. If you have a real question, you can ask it, but that's not a proper question either here or in court.
Q Did you want to explain that answer?
A Oh.
Q It seems like you were about to speak. That's all I'm asking. If you don't, that's fine, and we can end. I just want --
A No. You know, I would be happy to elaborate that because, you know, the whole nature of the deposition is to force me to answer yes and no to things that are profoundly complicated. And I gather that's -- the purpose of that is for the trial. But the -- what I want to say is that theoretically there could be a person who is in prison who -- that the psychological pathway of ensuring informed consent and increasing maturation

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and improving coping capacities of that person to deal with this life and recognizing the impact of the past on his present distress, you see, theoretically, it is possible that in a state that allows that like Massachusetts or California, that with the proper preparation, if the patient persists in requesting sex reassignment surgery, I think it's reasonable for that particular person. But that is different than all people with gender dysphoria ought to have a pathway to this, you see, to surgery. Mr. Rose asked me basically on a theoretical sense given the fact that I believe if a pathway exists, so I said yes, but I don't know how frequently that would happen given what I understand about the associated psychopathologies and the numerous adversities of these prisoners that I have seen over the 17 years working with prisoners have.
And if you recall the Osborne and Lawrence study, they too had a lot of criteria that had to be met before they would even consider it, but they thought it was -- they would have given the same answer that I gave to Mr. Rose. Theoretically there's a person who might have qualified for it and it would be reasonable but not most of them.

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That's what I wanted to say. I think you guys are done with me.
MR. ROSE: I think so. Thank you for your time today, Doctor.
THE WITNESS: I hope you're hungry, all of you. Bye, everyone. Are you and I done now, Alex?
MR. CARLISLE: I have one more question. Do you want to review the transcript and sign off on it, or do you want to waive that opportunity? It doesn't matter to me.
THE WITNESS: I would prefer to waive the opportunity just because it's just too difficult, too boring.
MR. CARLISLE: All right. We will waive signature then.
THE WITNESS: Thank you.
MR. CARLISLE: That's all I have for you, Doctor.
THE WITNESS: All right. Good afternoon, everyone.
MR. ROSE: Take care Doctor. Thank you. And, Madam Court Reporter, you remember that we asked for a rush for this week?
THE REPORTER: Yes. So an electronic delivery Friday would be okay?

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MR. ROSE: That's perfectly fine. Thank you.
THE REPORTER: That's no problem. Mr. Carlisle, do you need a copy?
MR. CARLISLE: Yes, please.
THE REPORTER: E-Tran?
MR. CARLISLE: E-Tran is fine.
THE REPORTER: Do you also need it by Friday or just regular?
MR. CARLISLE: Just regular.
AND FURTHER THE DEPONENT SAITH NOT.

(Signature waived)
STEPHEN BARRETT LEVINE, MD

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STATE OF INDIANA)
) SS:
COUNTY OF JOHNSON)

I, Gretchen Fox, RPR, a Notary Public in and for the County of Johnson, State of Indiana at large, do hereby certify that STEPHEN BARRETT LEVINE, MD, the deponent herein, was by me first duly sworn to tell the truth, the whole truth, and nothing but the truth in above-captioned cause.

That the foregoing deposition was taken on behalf of the Plaintiff remotely via Zoom videoconference on the 7th day of February, 2024, pursuant to the Applicable Rules.

That said deposition was taken down in stenograph notes and afterwards reduced to typewriting under my direction, and that the typewritten transcript is a true record of the testimony given by said deponent; and that the signature of said deponent to his/her deposition was waived by the deponent and all parties present, the deposition to be read with the same force and effect as if signed by him/her.

That the parties were represented by their aforementioned counsel;

I do further certify that I am a disinterested person in this cause of action; that I am not a relative or attorney of either party, or otherwise

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interested in the event of this action, and am not in the employ of the attorneys for either party.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal this _____ day of _____, 2024.

_____
Gretchen Fox

Commission Number 066154
My Commission Expires:
January 25, 2031

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Review – Reconstructive Urology

Genital Reconstructive Surgery in Male to Female Transgender Patients: A Systematic Review of Primary Surgical Techniques, Complication Profiles, and Functional Outcomes from 1950 to Present Day

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Abstract

Context: Genital reconstructive surgery (GRS) is a necessary part of transitioning for many transwomen, and there is evidence of positive effects on a person's well-being and sexual function. Surgical techniques have evolved, from pursuing aesthetic outcome to now functional outcome with natal females as the standard.
Objective: To systematically review the evidence, identifying the surgical techniques used in primary GRS, their complications, functional outcomes, and the tools used to assess them.
Evidence acquisition: The clinical question was designed using the standard PICOS format. The search complied with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2009 statement and was performed by two independent reviewers.
Evidence synthesis: Europe, USA, and Thailand favour the penoscrotal technique for vaginoplasty, whereas in the UK, the penile inversion (PI) technique predominates. Primary vaginoplasty using a segment of bowel is less common, and all three techniques have comparable rates of intraoperative rectal injury. The incidence of rectovaginal fistula is reportedly higher in the PI technique. Wound haematoma and vaginal prolapse rates are comparable. Higher rates of clitoral necrosis, urethral meatal stenosis, and wound infection are reported in PI. However, the ability to orgasm, ability to have penetrative sexual intercourse, and satisfaction with aesthetic result are better with PI.
Conclusions: The evidence for GRS complications and functional outcomes is of low level. Standardised nomenclature reporting of adverse events and robust patient-reported outcome measures (PROMs) are lacking. PROMs are a powerful assessment tool, and standardised definitions of adverse events and functional outcomes should be a priority of future research.
Patient summary: We looked at all studies published on genital reconstructive surgery from 1950 to the present day. We assessed each surgical technique and their associated complication rates, sexual and urinary function outcomes, and how they were reported. We found the evidence to be low and weak. We suggest more robust ways of reporting complications, and the impact on patients' quality of life should be investigated.

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1. Introduction

The epidemiology of gender dysphoria has been reported variably (see Table 1) [1–7]. A systematic review in 2015 looked at the prevalence and incidence of gender dysphoria, and the authors included 21 appropriate studies (1974–2014), 12 of which had sufficient data for meta-analysis [4]. They reported the overall prevalence of transwomen to be 1 in 11 650 (8.6 per 100 000) [4]. However, all data published were heterogeneous in the way transgender people were identified and were limited to those who presented to gender identity clinics with gender dysphoria, had commenced hormone therapy, or had undertaken genital reconstructive surgery. However, there are no published data regarding gender variance or gender nonconforming identity, and the considerable social, personal, and financial barriers faced, along with limitations in access to services in some regions, have resulted in a feeling that this is an underestimate of prevalence [4].

Transsexual people may choose to align their outward appearance and role in society with that of their perceived gender. In the case of male to female transsexual patients, the transwoman will live and work as a woman. She may elect to make alterations to her outward appearance, and permanent changes require hormonal manipulation and surgical correction. Not all transwomen choose to undergo genital reconstructive surgery, but for many it is a necessary step in their life journey marrying their bodies with their perceived gender. There is evidence to support genital reconstructive surgery and its positive effects on a person's well-being and sexual function [2,8–14]. In the UK, the National Health Service (NHS) commissions genital reconstructive surgery recognising that surgery can help those people become functioning and contributing members of the society rather than being marginalised outsiders.

In this review, we have looked at 67 yr of literature. Gender dysphoria was first described in 1949 by Caudwell and again by Benjamin in 1953 as psychopathia transsexualis, and the first paper on transsexualism was subsequently published in a psychotherapy journal in 1954 [7]. The first recorded genital surgery for gender dysphoria was performed in Europe in the early 1900s [7]. The very first case was a transman in 1917, but perhaps the most famous one is well chronicled in the book "Man into woman" written by the transwoman herself, Lile Elbe, in 1930 (and most recently made into Hollywood blockbuster *The Danish Girl*). Genital reconstructive surgery was first performed in the USA in 1966 at the John Hopkins Medical Centre, and it is from around this time that more comprehensive medical literature appears [7]. The authors have looked at studies (of six or more patients) rather than case reports in this systematic review and, as a result, have therefore elected to analyse the medical literature from 1950 to present day. The fundamental principles of genital reconstruction at earlier time were similar to those of modern day surgery, although more often performed as staged operations: orchidectomy, penectomy, and then vaginoplasty.

What is striking is the progress that the medical fraternity has made in how it identifies with transgender people. Early papers would refer to male to female transsexual patients using male pronouns or as male transsexuals. Today, we describe the transwoman in medical literature recognising her female identity. Similarly, genital reconstructive surgery, as it is now known, has been referred to in many different ways over the years: transsexual surgery, sex reassignment surgery, gender reassignment surgery, gender confirming surgery, and gender affirming surgery. Follow-up studies and outcome measure definitions have also changed. In early studies, integration into society and "stability" were major outcome measures, defined by whether the patient had married without their spouse knowing their natal sex phenotype. The purpose of original male to female transsexual surgery was often simply to remove the unwanted male genitalia. As techniques developed, a more feminine perineum was achieved. It is the transwoman who has then driven further changes in technique, and unlike any other field of surgery, these women have pushed surgeons to focus on functional as well as aesthetic results. How we measure these outcomes has also begun to shift from surgeon reported to patient reported, and where emphasis might have previously been more on aesthetic outcomes, it is now just as important to the patient to have good functional outcomes assuming a great aesthetic comparable with natal female genitalia.

The principles of male to female genital reconstructive surgery are to reconstruct appearance and function taking natal females as the standard. The neovagina must be hairless, moist, and have elastic epithelium with minimum dimensions of 11 cm depth and 3 cm width [11,13]. Labia minora, majora, and a sensate clitoris must also be present [11,13,14]. It was common in the early 2000s to do this in a two-staged procedure, where patients underwent a separate labiaplasty 8–12 wk after initial operation, with a Z-plasty on the reconstructed mons pubis to pull the labia majora together, thus creating labia minora. All these are now more usually performed in one stage at the initial operation.

Table 1 – Summary of transgender epidemiology currently reported in the literature.

	UK	Europe	North America
Gender dysphoria (presentation to Gender Identity Clinic)	1 in 5000	0.44–12.11 in 100 000	No published data
Genital reconstructive surgery (includes both MTF and FTM genital surgery)	No published data	4.03–11.57 in 100 000	No published data
Prevalence of "transsexualism"	No published data	1 in 12 900	1 in 100 000

FTM = female to male; MTF = male to female.

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The variations in technique come from which tissue is used to construct the neovagina. The "penile inversion technique" involves degloving the penis via a midline perineal incision, closing the end of the skin tube and invaginating that into the newly dissected neovaginal cavity. An incision is made on the superior aspect of the invaginated skin tube to expose the neoclitoris and to allow subsequent urethral meatoplasty. The "penoscrotal technique" involves creation of a flap of scrotal skin, raised on the posterior scrotal arteries and anastomosed to the penile skin tube, which is opened in the midline ventral aspect to provide adequate width and depth. Where adequate neovaginal depth cannot be achieved with penile inversion or penoscrotal techniques, a bowel substitution vaginoplasty involves anastomosing a segment of bowel (ileum, sigmoid, and colon have been used) brought down on its mesentery to the perineal skin directly, if primary surgery, or cuff of inverted skin when skin techniques have failed (Fig. 1).

Worldwide penoscrotal techniques seem to predominate with some using free skin grafts to add depth. The UK seems to use the penile inversion technique more [15]. A variant on this technique is using the redundant urethra after it has been shortened for meatoplasty as a pedicled flap to line the anterior neovaginal wall. In more recent years, transgender patients are commencing hormone therapy in early adolescence with a resulting penile hypoplasia that can make creating a neovagina with adequate depth impossible. While studies have described using segments of bowel in revision surgery to create an adequate neovagina, more recently surgeons are describing using bowel for the neovagina in primary genital reconstructive surgery, with many using a laparoscopic approach to harvest the bowel [16,17].

The objective of this systematic review was to evaluate the various surgical techniques for primary genital reconstructive surgery in transwomen from 1950 to the present day. We set out to report a literature consensus on the complication profile expected with each surgical technique, and to evaluate and report on a literature consensus for functional outcomes. We are looking to ascertain how functional outcomes are defined by the surgeon and by the patient, as well as providing comment on the literatures' level of evidence and how confident we can be in any recommendations made.

To achieve the above objectives, we aim to systematically identify papers using relevant search terms and select appropriate original studies for inclusion. Each paper is then to be critiqued, and data are to be extracted and synthesised to relevant summaries of evidence. We aim to identify what techniques are used, what their individual complication profiles are, and what functional outcomes are recorded.

2. Evidence acquisition

A literature search was systematically performed by two independent researchers. Search terms included genital reconstructive surgery, transgender surgery, gender reassignment surgery, sex reassignment surgery, transsexual surgery, complications, adverse events, functional outcomes, and patient-reported functional outcomes (see the Supplementary material for a complete list of search terms). Studies with no English translation available and case reports (fewer than six patients) were excluded. Studies were reviewed from 1950 to the present day. A total of 1292 studies were identified on initial search of PubMed, Medline, CENTRAL, Ovid, and EMBASE databases. Unpublished work was not included in this search. Data acquisition was based solely on search terms and papers identified here. We did not review article references for further studies not identified by our search terms. After abstract screening, 40 studies where identified for full paper review.

Only studies with original data, regarding primary genital reconstructive operations in male to female transgender patients, were included. All review articles with no original data were excluded. Studies that did not identify their technique, studies that looked at more than one technique but did not separate out the data, studies that looked at both primary and secondary bowel neovaginas but did not separate out the data, and studies

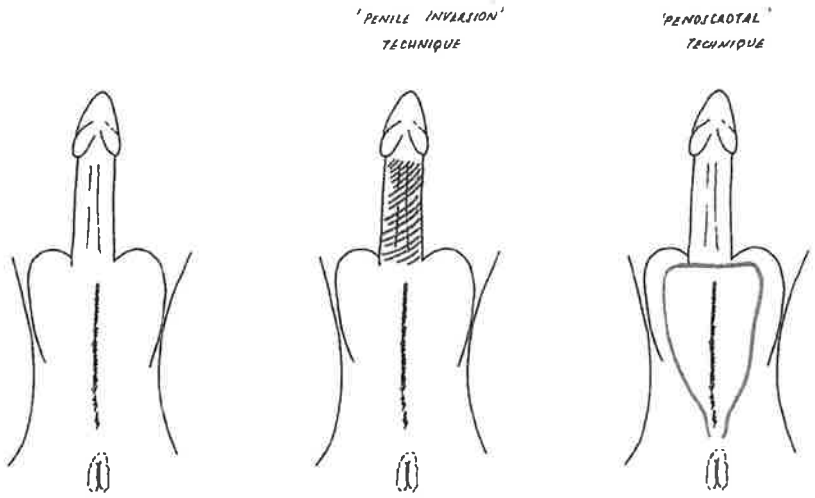

Fig. 1 – Diagramatic representation of the difference in the initial incision for penile inversion versus the penoscrotal technique.

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that looked at primary bowel neovaginas in natal females and transgender women but did not separate out the data were excluded.

All included papers were graded according to the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) system of evaluating evidence. Each paper was classified according to its level of evidence (low, moderate, or high) and then according to its strength of evidence, or our confidence in that evidence (weak or strong). This surgery is not performed in very large numbers, and as such all papers were cohort studies, most of which were retrospective analyses of a single surgeon's or a group of surgeons' work over several years. By definition, these are all judged as low-level evidence. Even the larger series, when compared with other surgical fields, are very small. However, when referenced in the context of the size of the transgender community, there are some large series that were judged to be a moderate strength of evidence within their field. The confidence in the data was variable. When judging the strength of the recommendation from each paper, these large studies with clearly defined complications were graded as strong. Where papers had poorly defined complication reporting or were using questionnaires not validated in the transgender patient or any patient group (study author constructed), the strength of the recommendation from each paper was judged to be weak. Unfortunately, most of the evidence in this field of surgery is of low level and weak in its recommendation.

Data extraction was performed by two independent researchers and cross-referenced for errors.

Statistical analysis was not possible, as the data extracted for complications and functional outcomes were very heterogeneous. This is a result of nomenclature changing over the years, as well as English translations not always being colloquial to English-speaking surgeons, such that complications are described in a number of different ways. Functional outcomes are also often not well defined, and usually the construct of a questionnaire was designed and worded by the study author. Some functional outcomes are reported purely by the study author, while others are patient reported. For example, regarding the reporting of sexual function, patients are asked to comment in author-designed questionnaires on whether they have "erogenous sensibility of the neoclitoris" in one paper [11] and whether they are "able to achieve orgasm" in another [18]. Other papers have simply asked for satisfaction during intercourse regarding vaginal function and clitoral sensation using a subjective Likert scale [1]. These are all very different functional outcomes to describe, and in the absence of a standardised way of asking the question, validated in this patient group, the answers will be difficult to interpret.

Reporting of complications suffers similar heterogeneity. Without standard complication reporting systems in place, studies were not declaring the absence of certain significant complications such as development of rectovaginal fistula, which is a rare but recognised complication of this surgery. Ambiguity in reporting of postoperative bleeding versus haematoma formation, and whether that required return to theatre or alternatively blood transfusions are other examples [19,20].

The lack of standardised outcome measures for both complications and functional outcomes made it impossible to perform a statistical analysis that one could be confident in reporting. As such, all the data are summarised for each technique and reported as percentage ranges.

3. Evidence synthesis

During the perioperative period, the key differences noted are the higher rates of bleeding requiring transfusion in the

Table 2 – GRS surgical technique and associated complication profiles.

Complication		Penile inversion technique complication rate, % (no. of occurrences/no. of procedures)	Penoscrotal technique complication rate, % (no. of occurrences/no. of procedures)	Bowel technique complication rate (no. of occurrences/no. of procedures)
Intraoperative	Rectal perforation	2.46 (27/1097)	2.72 (19/699)	2.38 (1/42)
	Bleeding	5.01 (45/899)	3.02 (25/829)	4.76 (2/42)
	Bleeding requiring transfusion	4.07 (30/737)	2.52 (19/753)	–
Immediate	Wound dehiscence	6.67 (4/60)	11.33 (34/300)	–
	Haematoma	4.26 (19/446)	4.49 (12/267)	–
	Vaginal segment necrosis	2.71 (12/477)	1.6 (21/1312)	2.38 (1/42)
	Abscess	2.71 (20/737)	0 (0/70)	4.76 (2/42)
	Minor wound healing disorders	–	15.38 (12/78)	–
	Urethral necrosis	1.26 (5/398)	–	–
	Wound infection	14.65 (136/928)	4.63 (46/993)	–
	UTI	5.14 (22/428)	12.06 (17/141)	–
	Clitoral necrosis	2.75 (19/690)	0.60 (6/993)	–
Late	Urethrovaginal fistula	2.46 (21/853)	0.48 (3/626)	0.00 (0/42)
	Rectovaginal fistula	1.49 (15/1004)	0.34 (3/886)	0.00 (0/42)
	Introitus stricture	14.26 (123/862)	2.07 (2/145)	2.38 (1/42)
	Vaginal stenosis	7.19 (98/1363)	9.60 (63/656)	–
	Vaginal prolapse	2.84 (35/1233)	2.68 (34/1267)	2.38 (1/42)
	Urethral meatus stenosis	16.25 (200/1231)	10.69 (96/898)	–
	Urethral prolapse	2.25 (2/89)	–	–
	Aesthetic revisions/revisions to external genitalia required	23.03 (181/786)	21.90 (168/767)	–

GRS = genital reconstructive surgery; UTI = urinary tract infection; – = not reported.

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Table 3 – GRS surgical technique and associated functional outcomes.

Functional outcomes	Penile inversion technique outcome rate, % (no. of patients reporting the outcome/no. of patients questioned)	Penoscrotal technique outcome rate, % (no. of patients reporting the outcome/no. of patients questioned)	Bowel technique outcome rate, % (no. of patients reporting the outcome/no. of patients questioned)
Ability to orgasm	81.47 (431/529)	68.45 (141/206)	84.00 (21/25)
Erogenous sensibility present	89.19 (165/185)	86.80 (539/621)	–
Ability to have penetrative intercourse	61.58 (125/203)	33.33 (3/9)	–
Satisfactory aesthetic result	85.33 (314/368)	67.86 (19/28)	–
Pain[a]	7.50 (43/573)	18.67 (14/75)	–

GRS = genital reconstructive surgery; – = not reported.
[a] Dyspareunia, dysuria, and chronic and intermittent pain of genital region.

Table 4 – Summary of GRADE classification of all papers included in this systematic review.

	Classification of evidence: low Strength of recommendations made: weak	Classification of evidence: low Strength of recommendations made: strong	Classification of evidence: moderate Strength of recommendations made: strong
Number of papers/total number of papers	32/40	7/40	1/40
References as cited in this review paper	[1,2,11,13,14,16,18,19,23–30,32–47]	[12,15,17,20–22,48]	[49]

GRADE = Grading of Recommendations, Assessment, Development and Evaluations.

penile inversion group, higher rates of urinary tract infection in the penoscrotal group, and higher rates of abscess formation in the bowel vaginoplasty group (Table 2). All reported similar intraoperative rectal injury rates; however, long-term, higher rates of rectovaginal fistula formation are reported in the penile inversion group. The reasons for this are unclear and in direct contradiction to this senior author's experience. Higher rates of urethral and introital stenosis are reported in the penile inversion group also. All groups reported similar rates of neovaginal prolapse and minor aesthetic revision. Again, this is in direct contradiction to this senior author's experience, and it would be expected that the "penoscrotal technique" would have a higher incidence of neovaginal skin tube prolapse due to the skin being thicker when compared with the "penile inversion technique".

Ability to orgasm was reported to be lower in the penoscrotal group; however, similar levels of erogenous sensibility were reported in all groups. Patients reported being happier with the aesthetic outcome of penile inversion technique, and more were able to have penetrative intercourse without pain (Table 3). These results should be interpreted with caution; however, as again without validated questionnaires, these questions are open to bias in a patient group, in which not all are sexually active or engaging in penetrative intercourse.

Having a complication is not always associated with less sensation to the neoclitoris or less ability to reach orgasm. Circumcised patients might have altered clitoral sensation, which puts forward the question of whether circumcised patients can expect differing clitoral sensation outcomes [19]. This has not been answered in the literature and might be something for future studies to address, as it will help with appropriate counselling of patients and managing expectations in the future.

Overall regret after surgery is 0–5.5%. "Some regret", although not further defined, is expressed in 5.5% patients, as reported in the literature. "Consistent" regret after surgery is reported at 0.6% [21–23].

4. Conclusions

There are limitations to the literature available in this field of surgery. As a result of the rare prevalence of gender dysphoric patients seeking genital reconstruction, not many surgeons actually perform these operations, and historically they have come from varied disciplines of training. As a result, approaches and innovations in surgical technique have been surgeon specific rather than standardised. Similarly, the reporting of outcomes has not been standardised, and this has been complicated further by the changing nomenclature over the last 67 yr.

For example, how we define "functional outcomes" has changed over the decades. In the 1960s, 1970s and early 1980s, emphasis was on economic stability, social standing, and reintegration into the society, as defined by whether the patient was married, in a heterosexual relationship, or even with a family. Whether the spouse was aware that their partner was a transwoman was also commented on, and this was how functional success was defined [24,25]. For the last 17 yr, emphasis has shifted to define "functional outcomes" more literally. Can the patient have penetrative intercourse? Can the patient achieve orgasm? Is the patient satisfied with the aesthetic appearance? This is often concurrently graded by the surgeon themselves, who rate the cosmetic appearance and neovaginal depth that they may

be able to measure. Various tools have been used to formally assess patient satisfaction, including the Female Sexual Function Index, Female Genital Self-Imaging Scale, and the Amsterdam Hyperactive Pelvic Floor Scale—Women. Some authors choose to construct their own questionnaires regarding sexual function, ability to have penetrative sex, and orgasm. Asking a patient whether they are able to have "normal intercourse" however is open to interpretation, and ambiguity does not confer confidence in the data reported. These questionnaires, whether author constructed or preconfigured, are not validated in the transgender group. It continues to make it difficult to draw any meaningful conclusions, especially when a proportion of patients completing these functional questionnaires may not be sexually active at the time of completing them.

Outcomes are largely not formally defined in studies from the methodology. When results are displayed, they are not always tabulated even, but rather discussed in prose, if at all [26,27]. Some studies do not report important negative value outcomes, such as rectoneovaginal fistula rates or patient regret [28]. Secondary corrective surgery is also not always commented on in all studies, but is likely to be of interest to the new patient contemplating surgery. Secondary corrective surgery rates can be higher than one in five patients [20]. The observation of complications in the literature has, therefore, not been very robust.

The key differences that are reported between the three different techniques are in the penile inversion group, which report higher rates of rectovaginal fistula, and urethral and introital stenosis. The ability to orgasm is reportedly lower in the penoscrotal group, despite similar levels of erogenous sensibility. The cause for these discrepancies is unclear and contrary to the senior author's clinical experience. The heterogeneity of these reported results should be interpreted with caution, and as mentioned, many studies did not report negative outcomes. In the absence of standardised reporting, not all outcomes and complications are being accurately reported, or perhaps even reported at all.

The studies are retrospective cohort studies of small sample size by overall literature standards. Taking into account the rare prevalence of gender dysphoric patients seeking genital reconstruction, some cohorts are actually not that small; however, by GRADE standards, the level of evidence remains low, although in some series we can be more confident of the results where larger cohorts are reported (Table 4). Despite this, small numbers in each study make it impossible to perform statistical analysis, and the selection bias of all retrospective studies, particularly in the transgender population, is enormous. Many patients simply do not want to pay the costs of attending outpatient follow-up if there simply is no perceived complication [29], some patients decline to be involved in follow up studies wishing to forget their past, and some become completely uncontactable postoperatively [16]. Some authors further confounded this by simply excluding any patient not sexually active from their functional assessments [16].

The heterogeneity of this patient group itself can be problematic when reporting in the literature. For example, increasing body mass index is becoming problematic across all medical specialities. Many studies have reported on patient mean body mass index of approximately 22–24 kg/m^2 [13,17,23,29,30]. In the UK, a maximum body mass index of 31 kg/m^2 is acceptable prior to surgery. Vaginoplasty in more overweight patients will most likely increase the rate of neovaginal prolapse than is currently reported in the literature. Similarly, the average age of the transwoman requesting genital reconstruction is falling. One study postulated that sexual inexperience in the younger transwoman might also confound patient-reported functional outcomes compared with earlier data reported by the more mature transwoman [16].

What is clear from this systematic review of the literature over the last 67 yr is that the literature is deficient in its definition of outcomes of genital reconstructive surgery for the transwoman. Where studies have struggled in the past is in delivering robust patient-reported outcomes. For example, asking whether a patient is "capable of normal intercourse" is fraught with problems. Firstly, "normal intercourse" is not defined here and it is therefore open to interpretation, which confers ambiguous results. Secondly, what does capable mean? Is it as defined by the surgeon who has apparently measured an adequate neovagina, or is it defined by the patient who can use the neovagina for penetrative intercourse without pain or difficulty? The patient-reported outcome measure (PROM) is a far more powerful assessment tool, and standardised definitions of adverse events and functional outcomes should be a priority of future research [31].

The senior author's Team have constructed a PROM to assess functional results from genital reconstructive surgery in transfeminine people. The self-administered questionnaire includes four specific constructs, urinary function, sexual function, cosmetic appearance, and general health and well-being as perceived by the patient, and can be used pre- and postoperatively to assess changes related to surgery. In the postoperative instrument, questions regarding neovaginal dilation and maintenance have been included, a measure of perceived benefit of treatment and the opportunity to report any adverse outcomes of the surgery (complications, readmission, further surgery, etc.). The questions were adapted from existing PROMs following consultation with a patient focus group. The PROMs are in use in centres across the UK, and validation of these PROMs in the transgender population is underway.

The transwoman has been driving forward innovation in surgical technique, first requesting aesthetics and then function to equal that of the natal woman. The transwoman should therefore be at the heart of this future research, and PROMs are integral to standardising genital reconstruction surgery.

Author contributions: Charlotte Dunford had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.
Study concept and design: Dunford, Bell, Rashid.
Acquisition of data: Dunford, Bell.

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Appendix A. Supplementary data

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Surgical Outcome after Penile Inversion Vaginoplasty: A Retrospective Study of 475 Transgender Women

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Background: For many transgender women, vaginoplasty is the final stage in the gender-confirming process. Penile inversion vaginoplasty is considered the gold standard for vaginal construction in transgender women. In this study, the authors assessed intraoperative and postoperative complications after penile inversion vaginoplasty.

Methods: All patients who underwent penile inversion vaginoplasty between January of 2000 and January of 2014 were identified retrospectively from the authors' hospital registry. A retrospective chart review was conducted. Outcome measures were intraoperative and postoperative complications, reoperations, secondary surgical procedures, and possible risk factors.

Results: Between January of 2000 and January of 2014, 475 patients underwent penile inversion vaginoplasty, 405 of whom did not have and 70 of whom did have additional full-thickness skin grafts. The median patient age at surgery was 38.6 years (range, 18.1 to 70.8 years). Median follow-up was 7.8 years (range, 1.0 to 15.9 years). The most frequently observed intraoperative complication was rectal injury [n = 11 (2.3 percent)]. Short-term postoperative bleeding that required transfusion [n = 23 (4.8 percent)], reoperation [n = 7 (1.5 percent)] or both [n = 2 (0.4 percent)] occurred in some cases. Major complications comprised three (0.6 percent) rectoneovaginal fistulas, which were successfully treated. Revision vaginoplasty was performed in 14 patients (2.9 percent). Comorbid diabetes was associated with a higher risk of local infection (OR, 9.8; p = 0.003; 95 percent CI, 2.8 to 34.4), and use of psychotropic medication predisposed to postoperative urinary retention (OR, 2.1; p = 0.006; 95 percent CI, 1.2 to 3.5).

Conclusions: Successful vaginal construction without the need for secondary functional reoperations was achieved in the majority of patients. Intraoperative complications are scarce. Postoperative complications occur frequently but are generally minor and easily treated. (*Plast. Reconstr. Surg.* 138: 999, 2016.)

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, IV.

Vaginoplasty, the surgical construction of a vagina, is indicated as genital reassignment surgery for transgender women. For many transgender women, vaginoplasty is the final stage in the gender-confirming process.[1] Vaginoplasty has a positive impact on the (sexual) quality of life of these women.[2–6] The goal is to create a feminine vulva, a deep and wide enough vaginal cavity to facilitate neovaginal penetration, a hooded

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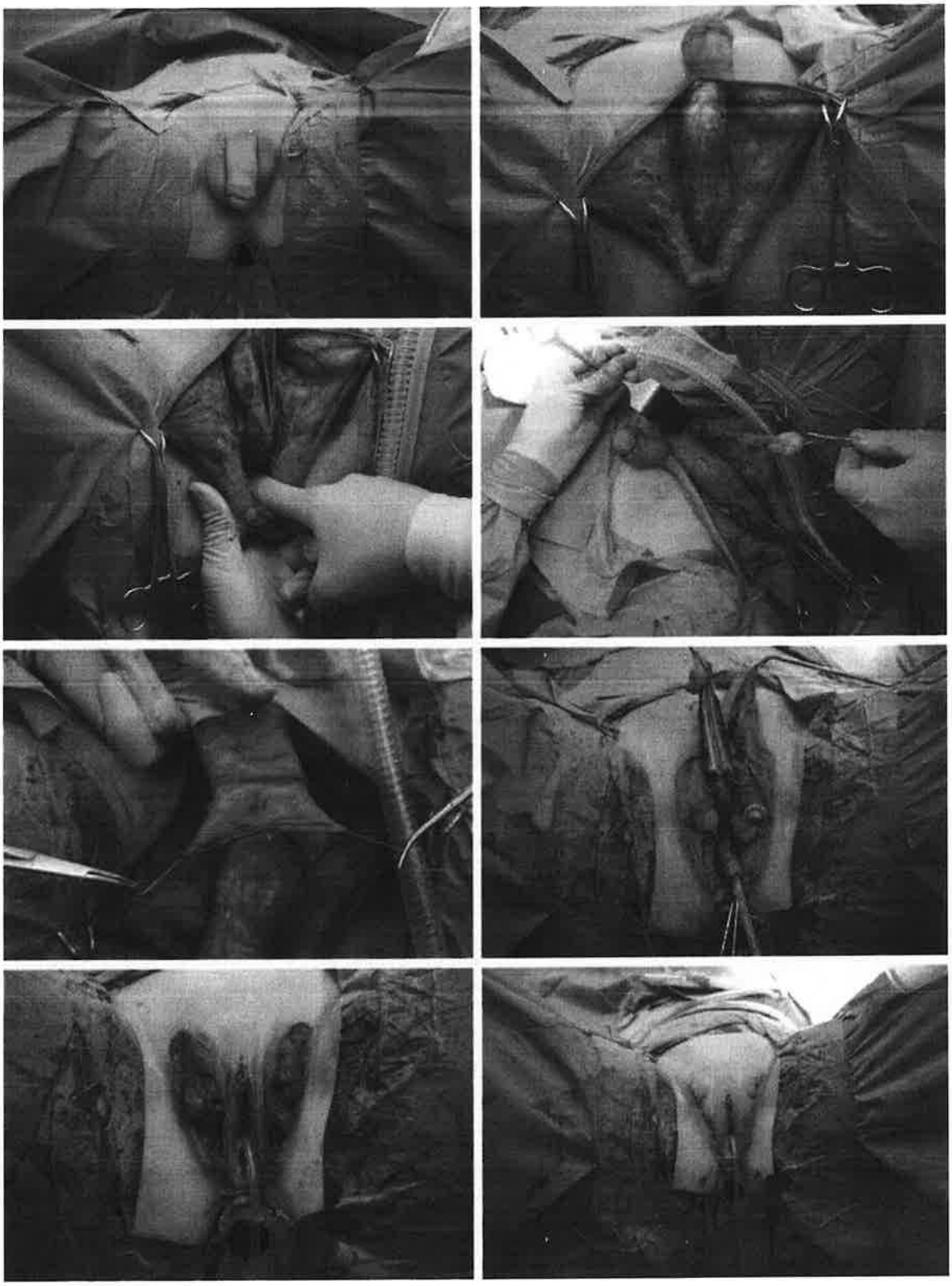

Fig. 1. Penile inversion vaginoplasty performed in a 51-year-old transgender woman. (*Above, left*) Preoperative photograph of the genital area. (*Above, right*) An incision is made along the preoperatively marked pattern. (*Second row, left*) Blunt dissection of the neovaginal cavity is performed. Caution is taken not to sever the rectum. This is regularly checked by bimanual palpation. (*Second row, right*) Bilateral orchiectomy is performed. (*Third row, left*) The penile skin is separated from the penile shaft and closed at the distal end. (*Third row, right*) The dorsal neurovascular bundle is separated from the roof of the corpora cavernosa, and from a part of the glans penis and preputium, (*Continued*)

sensate clitoris, and labia minora with the fewest possible surgical complications.[7] Penile inversion vaginoplasty is the most frequently performed procedure for vaginal construction in transgender women.[8–10] These patients report high satisfaction with both the functional and aesthetic results.[8] Although other surgical techniques exist (e.g., nongenital skin flap vaginoplasty, intestinal vaginoplasty, and peritoneal vaginoplasty), because of its advantages in producing a lined vaginal cavity that shrinks little and is non–hair-bearing and sensate, penile inversion vaginoplasty is still considered the surgical gold standard.[9,10] A full-thickness skin graft can be added to provide extra depth of the neovagina, when penile skin alone is insufficient. The aim of this study was to review our surgical technique and assess intraoperative and postoperative complications after penile inversion vaginoplasty and identify predictors for postoperative complications.

PATIENTS AND METHODS

Study Design

All transgender women who underwent penile inversion vaginoplasty between January of 2000 and January of 2014 at the VU University Medical Center were retrospectively identified from our hospital registry. A retrospective chart review was conducted recording patient demographics, intraoperative and postoperative complications, reoperations, and secondary surgical procedures. Recorded patient demographics comprised age at surgery, weight, length, body mass index, intoxications, somatic and mental medical history, and the use of medication. Recorded surgical data comprised date of surgery, performing surgeon, surgical technique (penile inversion with or without full-thickness skin graft), and operative duration. Furthermore, the length of hospitalization, intraoperative and postoperative complications, reoperations, and secondary surgical procedures were noted. Complications were categorized into three categories:

1. Intraoperative complications, subdivided into rectal or urethral lesions and bleeding needing transfusion.
2. Short-term postoperative complications, subdivided into infection, bleeding, any type of vaginal or vulvar necrosis, rectoneovaginal fistulas, and urinary complications (e.g., urinary retention and urinary tract infections).
3. Long-term postoperative complications, subdivided into stenosis, urinary complications, urethroneovaginal fistulas, and prolapse.

Fig. 1. Continued. the neoclitoris and the labia minora are sculptured. (*Below, left*) A linear incision is made into the raphe of the penile skin, and the penoscrotal flap is imbedded. (*Below, right*) Postoperative photograph of the genital area.

Patient Selection and Surgical Eligibility

All subjects were older than 18 years of age and had passed the real-life experience, in which a patient is expected to live for at least 1 year in the gender role consistent with her gender identity. Patients were deemed medically and psychologically fit by the multidisciplinary gender team of our institution (plastic surgeon, urologist, psychologist, endocrinologist, psychiatrist, and gynecologist). They were deemed eligible for surgery if the their body mass index was less than 30 kg/m^2 and if they had refrained from smoking more than 6 weeks before surgery (urine tests were taken at random). For each patient, psychological eligibility was assessed by qualified psychologists, appropriately trained in mental health and experienced in the assessment of gender dysphoria, through multiple counseling sessions, according to the Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People.[1] Hormonal therapy was stopped 6 weeks before surgery. If the penile skin was between 7 and 12 cm, an additional full-thickness skin graft was used if there was a wish from the patient to achieve more vaginal depth.

Surgical Technique

One day before surgery, patients are admitted for bowel preparation with a Microlax (Johnson & Johnson, New Brunswick, N.J.) enema. At the start of surgery, patients are given antibiotic prophylaxis intravenously (cefuroxime 1500 mg and metronidazole 500 mg). The patient is placed in lithotomy position and the surgical area is disinfected (Fig. 1, *above, left*). The penoscrotal flap is marked until 1 cm from the anus with dimensions of approximately 2 cm in width and 8 cm in length depending on the size of the penis, and the base of the penis and the midline on the ventral side of the penis. The operative area is infiltrated with lidocaine/adrenalin, and an incision is made along the marked pattern (Fig. 1, *above, right*). After separation of the penoscrotal flap from the bulbospongiosus muscle, a transurethral catheter of 18 to 20 French is inserted in the urethra and a tampon is inserted in the anus. The urogenital diaphragm is opened in the midline and the

levator ani muscle is incised to the left and right to create enough width for the neovagina. This provides access to the Denonvilliers space, which is dissected bluntly, taking care not to sever the urethra and rectum (Fig. 1, *second row, left*).

The tunica dartos is opened in the midline and an orchiectomy is performed (Fig. 1, *second row, right*). A circumcision is performed at the preputial base. The penile skin and the urethra are separated from the corpora cavernosa (Fig. 1, *third row, left*). The dorsal neurovascular bundle is separated from the roof of the corpora cavernosa, leaving the glans penis and preputium vascularized (Fig. 1, *third row, right*). From a part of the glans penis and preputium, the neoclitoris and the labia minora are sculptured. The corpora cavernosa are dissected to their base and resected at the level of the crura and sutured together, providing an elevation on which to place the neoclitoris. Guided by the transurethral catheter, a subtotal resection of the corpus spongiosum is performed and the remains are sutured together for hemostatic reasons. At the mons veneris, the subcutis is dissected off the periost, and the neurovascular bundle is positioned on the periost. The clitoris is positioned on the elevation. The shortened urethra is sutured into place just caudally of the clitoris. A longitudinal incision is made into the dorsal side of the penal skin, to bring the clitoris and urethra outward. Supportive stitches are placed at the corpora cavernosa to further define the anterior commissure. A linear incision is made into the raphe of the penile skin and the penoscrotal flap is imbedded (Fig. 1, *below, left*). If the amount of penile skin is deemed insufficient by the surgeon and if the patient preoperatively expresses the wish for a deeper vagina, a full-thickness skin graft is used to deepen the neovagina (Fig. 2). This is taken from either the excessive scrotal skin, skin of the groin area, or the lower abdomen. Most full-thickness skin grafts are taken from the excess scrotal skin. Two suction drains are positioned medially onto the perineum. Subsequently, the penoscrotal skin is inserted. Excessive scrotal skin is excised to define the labia majora. The skin is sutured, placing the scars in the groin area. A gauze-filled double condom is placed into the neovagina and fixed with translabial sutures. Over the years, there were no major changes in

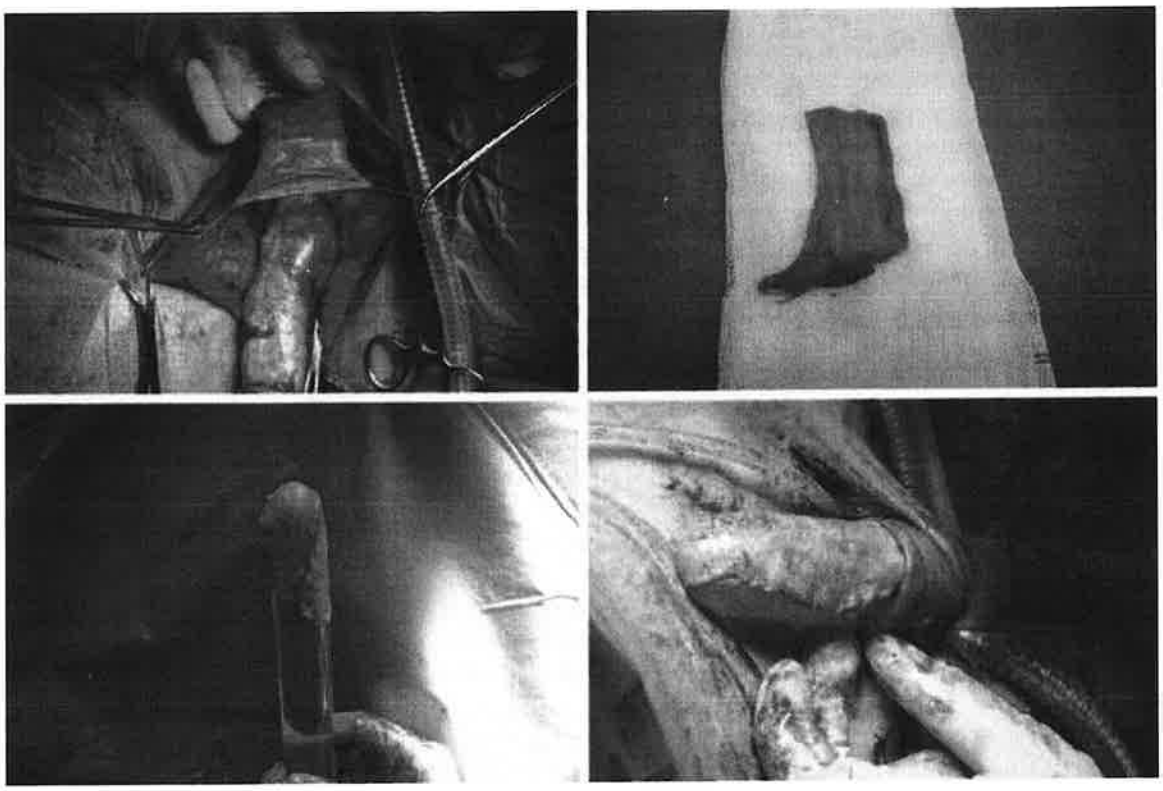

Fig. 2. Addition of scrotal full-thickness skin graft to penile inversion vaginoplasty. (*Above, left*) The inverted penile flap is not closed, facilitating full-thickness skin graft placement in the neovaginal top. (*Above, right*) A scrotal full-thickness skin graft is taken. (*Below, left*) The full-thickness skin graft is placed on a Perspex (Preecha Aesthetic Institute, Bangkok, Thailand) dildo. (*Below, right*) The full-thickness skin graft is sutured to the distal end of the inverted flap and subsequently placed in the neovaginal cavity.

Table 1. Patient Demographics

	Total (%)	Penile-Inversion Vaginoplasty without Additional FTG (%)	Penile-Inversion Vaginoplasty with Additional FTG (%)	*p*
No.	475	405	70	
Age, yr				0.70*
Median	38.6	38.6	38.4	
Range	18.1–70.8	18.1–70.8	18.4–59.2	
Mean BMI ± SD, kg/m^2	23.7 ± 3.1	23.8 ± 3.2	23.6 ± 2.7	0.62†
Cardiovascular comorbidity	59 (12.4)	52 (12.8)	7 (10.0)	0.51‡
Use of anticoagulants	15 (3.2)	14 (3.5)	1 (1.4)	0.37‡
Diabetes	14 (2.9)	13 (3.2)	1 (2.4)	0.66‡
HIV-positive	14 (2.9)	10 (2.5)	4 (5.7)	0.14‡

FTG, full-thickness skin graft; BMI, body mass index; HIV, human immunodeficiency virus.
*Mann-Whitney *U* test.
†Independent samples *t* test.
‡χ^2 test.

operative technique, just small refinements in the creation of the labia minora and majora and placement of the neoclitoris.

Postoperative Care

Patients receive additional prophylactic antibiotics (cefuroxime and metronidazole) 8 and 16 hours postoperatively and thromboembolic prophylaxis. From 2000 to 2012, ambulation would start at the fifth postoperative day. From 2012, ambulation started at the second postoperative day. On the fifth postoperative day, the tampon and transurethral catheter are removed and the wounds inspected. After removal of the transurethral catheter, spontaneous voiding is observed and checked with a bladder scan to determine whether there is bladder residue. Cotrimoxazole is given as antibiotic prophylaxis for urinary tract infection for 5 days. Patients are given instructions on how to dilate and rinse their neovagina, after which they are discharged from the hospital. They are given the instruction to dilate twice daily for 30 minutes for the first postoperative year and also rinse the vagina with povidone-iodine solution twice daily for the first 3 months. Scheduled outpatient clinic visits are set at 2 and 5 weeks, 3 and 6 months, and 1 and 2 years after surgery for follow-up. When patients are ambulant again, they can restart their cross-sex hormones.

Statistical Analysis

Statistical analyses were performed with IBM SPSS Version 20 for Windows (IBM Corp., Armonk, N.Y.). Values of $p < 0.05$ were considered significant. Categorical variables are described by frequency and percentage. Gaussian continuous variables were compared using the independent samples *t* test, non-Gaussian continuous variables were compared using the Mann-Whitney *U* test, and categorical variables were compared using the chi-square test. Univariate analysis of preoperative risk factors and postoperative complications was performed, and odds ratios with 95 percent confidence intervals were reported. This retrospective chart study was exempt from institutional review board approval. All photographed patients provided written informed consent.

RESULTS

Demographics

Between January of 2000 and January of 2014, a total of 475 patients underwent penile inversion vaginoplasty at our institution. Of those 475 patients, 405 (85.3 percent) were performed without and 70 (14.7 percent) with the use of additional full-thickness skin grafting. Patient demographics are listed in Table 1, subdivided by surgical technique. Of a total of 475 patients, 84 (17.7 percent) had a history of smoking and 28 (5.9 percent) had a history of drug use. Median follow-up was 7.8 years (range, 1.0 to 15.9 years). The surgical procedures were performed by seven separate staff members, mostly assisted by residents.

Operative Characteristics and Intraoperative Complications

The median operative duration was 213 minutes (range, 109 to 330 minutes). (**See Figure, Supplemental Digital Content 1**, which shows the box plot representation of operative duration per year, ***http://links.lww.com/PRS/B889***.) Additional full-thickness skin grafts, used predominantly after January of 2010, led to a prolonged intraoperative time [median, 216 minutes (range, 133 to 330 minutes) versus 200 minutes (range, 109 to 300

minutes); $p = 0.037$). Intraoperative complications are listed in Table 2. There was no intraoperative mortality. Intraoperative bleeding that required postoperative transfusion occurred in 23 patients (4.8 percent). Rectal injuries, which occurred in 11 patients (2.3 percent), were all sutured primarily. In one of these patients, a rectoneovaginal fistula became manifest, which was resolved later by fistulectomy and local transposition. In five patients (1.1 percent), urethral lacerations occurred, which were oversewn intraoperatively.

Short-Term Postoperative Complications and Hospitalization

An overview of short-term postoperative complications is presented in Table 2. There was no postoperative mortality. Major complications comprised three rectoneovaginal fistulas (0.6 percent), which were successfully treated with fistulectomy and local transposition under general anesthesia in two patients and conservatively in one patient. In 66 patients (13.9 percent), urinary retention occurred after removal of the transurethral catheter. This was treated by either temporary (re)placement of a urinary urethral ($n = 61$) or a suprapubic ($n = 5$) catheter. Local wound infection occurred in 22 patients (4.6 percent). Diabetic patients (OR, 9.8; $p = 0.003$; 95 percent CI, 2.8 to 34.4), patients who used anticoagulants (OR, 5.8; $p = 0.027$; 95 percent CI, 1.5 to 22.3), and patients with a history of drug use had a higher risk of local infection. Urinary tract infections occurred in 21 patients (4.4 percent), which could all be managed successfully with oral antibiotics. Patients with comorbid hypertension (OR, 3.7; $p = 0.024$; 95 percent CI, 1.3 to 10.8) or cardiovascular disease (OR, 3.9; $p = 0.009$; 95 percent CI, 1.5 to 10.0) or who used anticoagulants (OR, 6.1; $p = 0.024$; 95 percent CI, 1.6 to 23.7) had a higher risk of urinary infection. Patients with comorbid psychiatric disease and use of psychotropic medication had a higher chance of urinary retention

Table 2. Intraoperative and Postoperative Complications

	Total (%)	Penile Inversion (%)	Penile Inversion plus FTG (%)
No.	475	405	70
Intraoperative complications			
Rectal injury	11 (2.3)	10 (2.5)	1 (1.4)
Urethral injury	5 (1.1)	5 (1.2)	—
Short-term postoperative complications			
Infection			
Expectant	1 (0.2)	1 (0.2)	—
Antibiotics	19 (4.0)	18 (4.4)	1 (1.4)
Incision and drainage	2 (0.4)	2 (0.5)	—
Incision, drainage, and antibiotics	1 (0.2)	1 (0.2)	—
Bleeding			
Hematoma, expectant	16 (3.4)	15 (3.7)	1 (1.4)
Transfusion	23 (4.8)	22 (5.4)	1 (1.4)
Reoperation	7 (1.5)	5 (1.2)	2 (2.9)
Reoperation and transfusion	2 (0.4)	2 (0.5)	—
Necrosis			
Minor	117 (24.6)	101 (24.9)	16 (22.9)
Major*	3 (0.6)	3 (0.7)	0 (0)
Urinary			
Retention, CAD	61 (12.8)	51 (12.6)	10 (14.3)
Retention, SPC	5 (1.1)	5 (1.2)	—
Tract infection	21 (4.4)	20 (4.9)	1 (1.4)
Neovaginal prolapse			
After tampon removal	3 (0.6)	3 (0.7)	—
Fistula			
Rectoneovaginal	3 (0.6)	2 (0.5)	1 (1.1)
Long-term postoperative complications			
Stenosis			
Introital stenosis (introital plasty)	12 (2.5)	11 (2.7)	1 (1.4)
Neovaginal stenosis	15 (3.2)	11 (2.7)	4 (5.7)
Urinary			
Meatal stenosis	46 (9.7)	42 (10.4)	4 (5.7)
Splayed urinary stream	45 (9.5)	39 (9.6)	6 (8.6)
Fistula			
Urethroneovaginal	8 (1.7)	8 (2.0)	—
Prolapse			
Partial	18 (3.8)	15 (3.7)	3 (4.3)

FTG, full-thickness skin graft; CAD, coronary artery disease; SPC, suprapubic catheter.
*Necrosis was defined as major if surgery under general anesthesia was necessary.

(OR, 2.1; $p = 0.006$; 95 percent CI, 1.2 to 3.5), which occurred in 66 patients (13.9 percent).

Small wound dehiscence and minor wound necrosis for which no action was required occurred in 117 patients (24.6 percent). In three patients (0.6 percent), necrosis necessitated surgical débridement under general anesthesia. Neovaginal prolapse after tampon removal occurred in three patients (0.6 percent), which could all be addressed by repositioning of the penile inversion flap and tampon replacement for 5 days in combination with bedrest. Occurrence of short-term postoperative complications contributed to prolonged hospitalization ($p < 0.001$). Hospitalization duration declined over the years, from a median of 8.5 days (range, 7 to 15 days) in 2000 to 6 days (range, 5 to 9 days) in 2014. (**See Figure, Supplemental Digital Content 2**, which shows median hospitalization length after penile inversion vaginoplasty over the years with interquartile ranges presented, ***http://links.lww.com/PRS/B890***.) There was no intersurgeon variability with regard to intraoperative and postoperative complications.

Long-Term Postoperative Complications

An overview of long-term postoperative complications is presented in Table 2. Revision vaginoplasty was performed in 14 patients (2.9 percent), all because of neovaginal stenosis. One patient with neovaginal stenosis refrained from undergoing revision vaginoplasty for unknown reasons. In 354 patients (74.5 percent), no reoperations were performed to enhance either neovaginal or urinary function.

The most common minor complications were related to the urinary tract. Meatal stenosis occurred in 46 patients (9.7 percent) after a median postoperative time of 4 months (range, 1 to 130 months). A splayed urinary stream occurred in 45 patients (9.5 percent) after a median postoperative time of 8 months (range, 3 to 151 months).

Meatal stenosis and a splayed urinary stream were primarily treated with meatotomy, possibly in combination with resection of the remains of the corpus spongiosum. Introital stenosis was observed in 12 patients (2.5 percent) after a median postoperative time of 0.5 years (range, 0.3 to 8.9 years). All were successfully treated by introital plasty by means of local transposition flaps. Partial prolapse occurred in 18 patients (3.8 percent). This usually comprised prolapse of the penoscrotal flap and could be easily corrected with minor surgery in all patients. Secondary cosmetic corrections were performed in 160 patients (33.7 percent), predominantly labia correction under local anesthesia.

DISCUSSION

Penile inversion vaginoplasty is the surgical gold standard for vaginal reconstruction in transgender women.[9,10] We present the largest cohort study to date, examining intraoperative and postoperative complications. There were no significant differences in surgical outcome between penile-inversion vaginoplasty with or without the use of an additional full-thickness skin graft. The most frequently observed intraoperative complication was rectal injury [$n = 11$ (2.3 percent)]. Bleeding noticed immediately postoperatively, which required transfusion, a reoperation, or both, occurred in approximately 6 percent of patients. The site of the bleeding, urethra, and remnants of the corpora are not specified and thus could not be distinguished. When examining the data, all but two transfusions were given before 2010. There were no major changes in operative technique, nor was it surgeon dependent. The reason for the high rate of blood transfusions before 2010 was not identified. Bleeding-related complications are reported to occur in 1.7 to 6.0 percent in the literature. Major long-term complications, with a median follow-up of 7.8 years, comprised three rectoneovaginal fistulas (0.6 percent), which were successfully treated. In our study, successful vaginal reconstruction was achieved in the vast majority of patients; only 14 patients (2.9 percent) needed revision vaginoplasty, all because of neovaginal stenosis.

An overview of the literature on intraoperative and postoperative complications of penile inversion vaginoplasty is presented in Table 3. Intraoperative complications during penile inversion vaginoplasty are scarce. We reported 11 cases (2.3 percent) of rectal injury and five cases of (1.1 percent) urethral injury. This is consistent with current literature, in which rectal injury is reported in 0.4 to 4.5 percent of patients.[11–19] Less is reported on the incidence of urethral injury. In a study of Rossi Neto et al., urethral injury occurred in 12 of 332 patients (3.6 percent).[16]

Meatal stenosis was observed in 46 patients (9.7 percent) in our study. The reported incidence of meatal stenosis after penile inversion vaginoplasty varies widely throughout the literature, from 1.1 to 39.8 percent.[11–13,15–17] At our institution, the transurethral catheter remains in place until the fifth postoperative day. In studies where meatal stenosis is more prevalent, the transurethral catheter is removed at an earlier stage, such as in the study by Rossi Neto et al., where the transurethral catheter is removed on the second postoperative day.[16]

Table 3. Literature Review of Studies Assessing Intraoperative and Postoperative Complications after Penile Inversion Vaginoplasty

	Perovic et al., 2000[11]	Krege et al., 2001[12]	Goddard et al., 2007[13]*	Wagner et al., 2010[14]	Reed et al., 2011[15]	Rossi Neto et al., 2012[16]	Raigosa et al., 2015[17]	Sigurjonsson et al., 2015[18]	Wangjiraniran et al., 2015[19]
Patient number	89	66	233	50	250	332	60	205	395
Operative time, min									
Mean	NR	380	NR	190	180	NR	NR	197	180
Range	NR	240–540	NR	160–220	47–490	NR	NR	82–403	150–240
Hospitalization, days									
Median	NR	NR	10	10	NR	NR	NR	7	NR
Range	NR	NR	6–21	6–14	NR	NR	NR	5–33	NR
Intraoperative complications, %									
Rectal injury	1.1	4.5	0.4	—	2.8	3.3	1.7	—	—
Urethral injury	—	—	—	—	—	3.6	—	—	—
Postoperative complications, %									
Bleeding-related complications	—	—	3.2	6.0	2.4	3.3	1.7	10.7	3.0
Wound infection	—	9.1	16.8	—	—	—	—	9.8	4.0
Rectoneovaginal fistula	1.1	1.5	—	—	—	1.8	3.3	2.0	—
Urethroneovaginal fistula	—	1.5	—	—	0.8	3.9	—	—	—
Meatal stenosis	1.1	10.6	23	—	6.0	39.8	8.3	—	—
Splayed urinary stream	—	—	20	—	—	—	—	—	—
Introital stenosis	6.7	—	—	—	—	14.5	—	—	—
Neovaginal stenosis	2.2	4.5	6.1	—	1.2	12.0	3.3	—	—
Prolapse	—	3.0	1.8	—	2.4	1.2	—	—	0.3

NR, not reported.
*Not all patients underwent vaginoplasty; some patients underwent penectomy, urethroplasty, and labiaplasty without opting for a skin-lined neovagina.

However, prolonged urinary catheterization may lead to a higher risk of catheter-related urinary tract infections.

Introital [n = 12 (2.5 percent)] and vaginal [n = 15 (3.2 percent)] stenosis were observed in our study, but not frequently. Both can impede the possibility of neovaginal penetration and adversely affect sexual quality of life. In the literature, the reported incidence of introital stenosis (6.7 to 14.5 percent) is higher.[11–13,15–18] This difference could be attributable to postoperative dilation frequency or the use of the perineoscrotal flap, none of which can be corroborated in the literature. At our institution, patients are advised to dilate twice daily for 30 minutes to minimize the chance of developing introital and/or vaginal stenosis. If introital stenosis occurs, self-dilation with the help of a pelvic floor physiotherapist is the treatment of choice.

In our study, comorbid diabetes was associated with a higher risk of local infection after penile-inversion vaginoplasty. For many types of surgery, this has been shown to be the case.[20] Presumably, wound healing is delayed by an altered inflammatory response, because of hyaline arteriolosclerosis and impaired leukocyte function caused by high glucose levels. Strict preoperative and postoperative glucose regulation may lower the rate of postoperative local infections.[21] Patients with comorbid psychiatric disease and use of psychotropic medication had a higher risk of postoperative urinary retention. The anticholinergic effect of psychotropic drugs possibly plays a role in this process.[22] No association was found between body weight and postoperative complications, but most patients had a body mass index less than 30 kg/m^2. In general, more of infections and wound healing problems are reported in overweight patients.[23]

A strength of our study is the high case volume reported on. A weakness of our study is that patients with complications may have presented at other (international) institutions, which may influence long-term follow-up data. However, our institution is the only institution in The Netherlands that offers all facets of transgender health care. Therefore, it is unlikely that they have consulted other centers in our country, without consultation of one of our surgeons.

CONCLUSIONS

After reviewing 475 penile inversion vaginoplasty procedures performed over the past 14 years,

we conclude that successful vaginal construction is achieved in the majority of patients without the need for a secondary functional reoperation. Intraoperative complications are scarce. The prevalence of postoperative complications is high, but most are minor and can be easily treated.

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ORIGINAL PAPER

Individuals Treated for Gender Dysphoria with Medical and/or Surgical Transition Who Subsequently Detransitioned: A Survey of 100 Detransitioners

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Abstract
The study's purpose was to describe a population of individuals who experienced gender dysphoria, chose to undergo medical and/or surgical transition and then detransitioned by discontinuing medications, having surgery to reverse the effects of transition, or both. Recruitment information with a link to an anonymous survey was shared on social media, professional listservs, and via snowball sampling. Sixty-nine percent of the 100 participants were natal female and 31.0% were natal male. Reasons for detransitioning were varied and included: experiencing discrimination (23.0%); becoming more comfortable identifying as their natal sex (60.0%); having concerns about potential medical complications from transitioning (49.0%); and coming to the view that their gender dysphoria was caused by something specific such as trauma, abuse, or a mental health condition (38.0%). Homophobia or difficulty accepting themselves as lesbian, gay, or bisexual was expressed by 23.0% as a reason for transition and subsequent detransition. The majority (55.0%) felt that they did not receive an adequate evaluation from a doctor or mental health professional before starting transition and only 24.0% of respondents informed their clinicians that they had detransitioned. There are many different reasons and experiences leading to detransition. More research is needed to understand this population, determine the prevalence of detransition as an outcome of transition, meet the medical and psychological needs of this population, and better inform the process of evaluation and counseling prior to transition.

Keywords Gender dysphoria · Detransition · Transgender

Introduction

Detransition is the act of stopping or reversing a gender transition. The visibility of individuals who have detransitioned is new and may be rapidly growing. As recently as 2014, it was challenging for an individual who detransitioned to find another person who similarly detransitioned (Callahan, 2018). Between 2015 and 2017, a handful of blogs written by individual detransitioners started to appear online, private support groups for detransitioners formed, and interviews with detransitioners began to appear in news articles, magazines, and blogs (Anonymous, 2017; 4thwavenow, 2016; Herzog, 2017; McCann, 2017). Although few YouTube videos about detransition existed prior to 2016, multiple detransitioners started to post videos documenting their experiences in 2016 and the numbers of these videos continues to increase.[1] In late 2017, the subreddit r/detrans (r/detrans, 2020) was revitalized and in four years has grown from 100 members to more than 21,000 members. A member poll of r/detrans conducted in 2019 estimated that approximately one-third of the members responding to the survey were desisters or detransitioners (r/detrans, 2019). The Pique Resilience Project, a group of four detransitioned or desisted young women, was founded in 2018 as a way to share the experiences of detransitioners with the public (Pique Resilience Project, 2019). In late 2019, the Detransition Advocacy Network, a nonprofit organization to "improve the well-being of detransitioned people everywhere" was launched (The

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[1] A search of the word "detransition" in YouTube can be filtered by date of upload. https://www.youtube.com/results?search_query=%22detransition%22&sp=CAI%253D22.

Detransition Advocacy Network, 2020) and the first formal, in-person conference for detransitioned people was held (Bridge, 2020). In the face of this massive change, clinicians have called for more research into the experiences of detransitioners (Butler & Hutchinson, 2020; Entwistle, 2021; Marchiano, 2020).

Although there were rare published reports about detransitioners prior to 2016, most of the published literature about detransition is recent (Callahan, 2018; D'Angelo, 2018; Djordjevic et al., 2016; Kuiper & Cohen-Kettenis, 1998; Levine, 2018; Marchiano, 2017; Pazos Guerra et al., 2020; Stella, 2016; Turban & Keuroghlian, 2018; Turban et al., 2021; Vandenbussche, 2021). The prevailing cultural narratives about detransition are that most individuals who detransition will retransition and that the reasons for detransition are discrimination, pressures from others, and nonbinary identification (Turban et al., 2021). However, case reports are shedding light on a broader and more complex range of experiences that include trauma, worsened mental health with transition, re-identification with natal sex, and difficulty separating sexual orientation from gender identity (D'Angelo, 2018; Levine, 2018; Pazos Guerra et al., 2020).[2] Detransitioners and desisters, in their own words, have provided additional depth to the discussion, describing that:

(1) Trauma (including sexual trauma) and mental health conditions contributed to their transgender identification and transition (Callahan, 2018; Herzog, 2017; twitter.com/ftmdetransed & twitter.com/radfemjourney, 2019)
(2) Their dysphoria and transition were due to homophobia and difficulty accepting themselves as homosexual (Bridge, 2020; Callahan, 2018; upperhandMARS, 2020)
(3) Peers, social media, and online communities were influential in the development of transgender identification and desire to transition (Pique Resilience Project, 2019; Tracey, 2020; upperhandMARS, 2020)
(4) Their dysphoria was rooted in misogyny (Herzog, 2017)

Two recently published convenience sample reports provide additional context about the topic of detransition. First, Turban et al. (2021) analyzed data from the United States Trans Survey (USTS) (James et al., 2016). The USTS contains data from 27,715 transgender and gender diverse adults from the U.S. who were recruited through lesbian, gay, bisexual, transgender, queer (LGBTQ), and allied organization outreach. The USTS included the question, "Have you ever detransitioned? In other words, have you ever gone back to living as your sex assigned at birth, at least for a while?" with the multiple choice options of "yes," "no," and "I have never transitioned." For the 2,242 participants who answered "yes," Turban et al. analyzed the responses to the multiple choice question, "Why did you detransition? In other words, why did you go back to living as your sex assigned at birth? (Mark all that apply)." Although most of the offered answer options were about external pressures to detransition (pressure from spouse or partner, pressure from family, pressure from friends, pressure from employer, discrimination, etc.), participants could write in additional reasons that were not listed. Turban et al.'s sample included more natal males (55.1%) than natal females (44.9%). Roughly half (50.2%) had taken cross-sex hormones and 16.5% had obtained surgery. The findings revealed that most (82.5%) of the sample expressed at least one external factor for detransitioning and 15.9% expressed at least one internal factor (factors originating from self).

The second study by Vandenbussche (2021) recruited detransitioners from online communities of detransitioners and analyzed data for the participants who answered affirmatively to the question, "Did you transition medically and/or socially and then stopped?" The sample of 237 participants was predominantly natal female (92%), and from the U.S. (51%) and Europe (32%). Most (65%) had transitioned both medically and socially. Participants selected from multiple choice options to indicate why they detransitioned with options covering a range of experiences. Respondents also had the option to write in additional reasons. Frequently endorsed reasons for detransition included realizing that their gender dysphoria was related to other issues (70%); health concerns (62%); observing that transition did not help their dysphoria (50%); and that they found alternatives to deal with their dysphoria (45%). In contrast to Turban et al. (2021), external factors such as lack of support, financial concerns, and discrimination were less common (13%, 12%, and 10%, respectively). Many in the sample described that when they detransitioned they lost support or were ostracized from lesbian, gay, bisexual, and transgender (LGBT) communities, suggesting that many of the participants in Vandenbussche (2021) would not have been reached by the recruitment efforts of the USTS (James et al., 2016).

The objective of the current study was to describe a population of individuals who experienced gender dysphoria, chose to undergo medical and/or surgical transition and then detransitioned by discontinuing medications, having surgery to reverse the effects of transition, or both. In contrast to Turban et al. (2021) and Vandenbussche (2021), this study focused only on

[2] The debate about the terminologies used to describe an individual's sex (including "assigned sex at birth," "biological sex," "natal sex," "birth sex," "sex," etc.) is far from settled. Although some professionals have argued for the use of "assigned sex at birth," others argue that this terminology is misleading and not consistent with the events that occur at birth and prior to birth (Bouman et al., 2017; Byng et al., 2018; Dahlen, 2020; Griffin et al., 2020). Supporting the unsettled nature of the discussion, I received conflicting comments from the reviewers of this manuscript about my selection of natal sex terms–one reviewer asked that I justify my preference for natal sex over the other terminologies; another reviewer expressed support for my use of natal sex. I prefer to use "natal sex" and "birth sex" because they are accurate and objective. Further, I propose that "natal sex" and "birth sex" might be seen as reasonable, polite compromise terms between "biological sex" and "assigned sex at birth."

individuals who transitioned and detransitioned medically, surgically, or both. For the purpose of this study, medical transition refers to the use of puberty blockers, cross-sex hormones, or anti-androgens and surgical transition refers to any of a variety of surgical procedures (common surgical procedures include mastectomy, genital surgery, and breast augmentation). This study does not describe the population of individuals who undergo medical or surgical transition without issue nor is it designed to assess the prevalence of detransition as an outcome of transition. Instead, the goal was to identify detransition reasons and narratives in order to inform clinical care and future research.

Method

Participants and Procedure

During the recruitment period, 101 individuals who met the study criteria completed online surveys. Inclusion criteria were (1) completion of a survey via Survey Monkey; (2) answering that they had taken or had one or more of the following for the purpose of gender transition: cross-sex hormones, anti-androgens, puberty blockers, breast surgery, genital surgery, other surgery; and (3) answering that they had done any of the following for the purpose of detransitioning: stopped taking cross-sex hormones, stopped taking anti-androgens, stopped taking puberty blockers, had any surgery to reverse transition. One survey was excluded for nonsense answers leaving 100 surveys for analysis. The sample included more natal females (69.0%) than natal males (31.0%) with respondents who were predominantly White (90.0%), non-Hispanic (98.0%), resided in the U.S. (66.0%); had no religious affiliation (63.0%), and support the rights of gay and lesbian couples to marry legally (92.9%) (see Table 1). At the time of survey completion, the mean age of respondents was 29.2 years (SD = 9.1) though natal females were significantly younger ($M = 25.8$; SD = 5.0) than natal males ($M = 36.7$; SD = 11.4), $t(98) = -6.56$, $p < .001$. Prior to transitioning, natal females were more likely to report an exclusively homosexual sexual orientation and natal males were more likely to report an exclusively heterosexual sexual orientation.

A 115-question survey instrument with multiple choice, Likert-type, and open-ended questions was created by the author and two individuals who had personally detransitioned. The author had met both detransitioners by way of introductions from colleagues. The author and both individuals who had detransitioned created questions for the survey, provided feedback, and revised the survey questions collaboratively with a focus on content, clarity, and relevance to a variety of transition and detransition experiences. The survey instrument included two questions that were adapted from an online survey of female detransitioners (Stella, 2016). Once completed, the survey was uploaded onto Survey Monkey (SurveyMonkey, Palo Alto, CA) via an account that was HIPAA-enabled.

Recruitment information with a link to the survey was posted on blogs that covered detransition topics and shared in a private online detransition forum, in a closed detransition Facebook group, and on Tumblr, Twitter, and Reddit. Recruitment information was also shared on the professional listservs for the World Professional Association for Transgender Health, the American Psychological Association Section 44, and the SEXNET listserv (which is a listserv of sex researchers and clinicians) and the professionals on the listservs were asked to share recruitment information with anyone they knew who might be eligible. Efforts were made to reach out to communities with varied views about the use of medical and surgical transition and recruitment information stated that participation was sought from individuals regardless of whether their transition experiences were positive, negative or neutral. Potential participants were invited to share recruitment information with any potentially eligible person or community with potentially eligible people. The survey was active from December 15, 2016 to April 30, 2017 (4.5 months). The median time to complete a survey was 49 min; 50% of the surveys were completed between 32 and 71 min. There were no incentives offered for participating. Data were collected anonymously, without IP addresses, and stored securely with Survey Monkey.

Participation in this study was voluntary. Electronic consent was obtained from all participants in the following manner. The first page of the online survey informed respondents about the research purpose, potential risks and benefits, that participation was voluntary, and provided contact information for the researcher. Survey questions were only displayed if the participant clicked "agree" which indicated that they read the information, voluntarily agreed to participate and were at least 18 years of age.

Measures

Demographic and Baseline Characteristics

Information was collected about participant age, natal sex, race/ethnicity, country of residence, educational attainment, socioeconomic status, religion, attitudes about legal marriage for gay and lesbian couples, and where they first heard about the study. The term sexual orientation in this article is intended to refer to the natal sex of the participant and the natal sex of the individuals with whom they are sexually attracted. Participants were asked to select one or more labels for how they identified their sexual orientation prior to transition with options inclusive of participant sex (e.g., asexual female, bisexual female, heterosexual female, etc.). These responses were coded to be consistent with participant natal sex and were categorized into homosexual, heterosexual, bisexual, pansexual, asexual, and multiple. The multiple category included respondents who

Table 1 Demographic and baseline characteristics

	Natal female *N* (%) *N* = 69	Natal male *N* (%) *N* = 31
*Race/ethnicity**		
White	62 (89.9%)	28 (90.3%)
Multiracial	6 (8.7%)	3 (9.7%)
Other	4 (5.8%)	0 (0%)
Asian	1 (1.4%)	1 (3.2%)
Hispanic	1 (1.4%)	1 (3.2%)
Black	0 (0%)	0 (0%)
Country of residence		
USA	46 (66.7%)	20 (64.5%)
UK	8 (11.6%)	1 (3.2%)
Canada	5 (7.2%)	4 (12.9%)
Australia	2 (2.9%)	2 (6.5%)
Other	8 (11.6%)	4 (12.9%)
Education		
Bachelor's or graduate degree	29 (42.0%)	18 (58.1%)
Associates degree	3 (4.3%)	1 (3.2%)
Some college but no degree	28 (40.6%)	9 (29.0%)
High school graduate or GED	8 (11.6%)	2 (6.5%)
< High school	1 (1.4%)	0 (0%)
Other	0 (0%)	1 (3.2%)
Socioeconomic status compared to others in country of residence		
Above average (somewhat or very much)	19 (27.5%)	12 (38.7%)
About average	20 (29.0%)	7 (22.6%)
Below average (somewhat or very much)	27 (39.1%)	12 (38.7%)
Prefer not to say	3 (4.3%)	0 (0%)
Categorized sexual orientation (by natal sex) prior to transition[a]		
Homosexual	18 (26.1%)	2 (6.5%)
Heterosexual	6 (8.7%)	12 (38.7%)
Bisexual	15 (21.7%)	8 (25.8%)
Pansexual	4 (5.8%)	1 (3.2%)
Multiple	20 (29.0%)	5 (16.1%)
Asexual	6 (8.7%)	3 (9.7%)
Religious affiliation		
No religious affiliation	41 (59.4%)	22 (73.3%)
Liberal Christian	5 (7.2%)	3 (10.0%)
Liberal Jewish	5 (7.2%)	0 (0%)
Conservative Christian	1 (1.4%)	2 (6.7%)
Liberal Muslim	1 (1.4%)	0 (0%)
Conservative Jewish	0 (0%)	0 (0%)
Conservative Muslim	0 (0%)	0 (0%)
Other	16 (23.2%)	3 (10.0%)
Legal marriage for gay and lesbian couples		
Favor	65 (97.0%)	26 (83.9%)
Oppose	1 (1.5%)	5 (16.1%)
Don't know	1 (1.5%)	0 (0%)
Source where participant first heard about study		
Detransition blogs	26 (37.7%)	15 (48.4%)
Other social media	37 (53.6%)	11 (35.5%)
A person they know	3 (4.3%)	3 (9.7%)
Other	3 (4.3%)	2 (6.5%)

*May select more than one answer

[a]Natal females were more likely to express an exclusively homosexual sexual orientation prior to transition ($\chi^2 = 5.15$. The p-value is .023). Natal males were more likely to express an exclusively heterosexual sexual

Table 1 (continued)

orientation prior to transition ($\chi^2 = 13.05$. The p value is $< .001$). Natal sex differences were not significant for individuals expressing pre-transition sexual orientations of bisexual, pansexual, multiple, and asexual. For bisexual sexual orientation, $\chi^2 = 0.20$. For pansexual sexual orientation, $\chi^2 = 0.29$. For multiple sexual orientations reported, $\chi^2 = 1.88$. For asexual sexual orientation, $\chi^2 = 0.02$

selected more than one response where responses indicated more than one pattern of sexual attraction (e.g., lesbian female and heterosexual female). Other questions about baseline characteristics included questions about diagnosed psychiatric disorders and neurodevelopmental disabilities, trauma, and non-suicidal self-injury (NSSI) before the onset of gender dysphoria.

Gender Dysphoria Onset and Typologies

Participants were asked how old they were when they first experienced gender dysphoria and whether this was during childhood, at the onset of puberty, during puberty, or later. Respondents were categorized as having early-onset gender dysphoria if they indicated that their gender dysphoria began "during childhood" and late-onset gender dysphoria if their gender dysphoria began "at the onset of puberty" or later. To evaluate typologies, participants were characterized by Blanchard's (1985, 1989) typology as homosexual (if the sexual orientations listed prior to transition were exclusively homosexual) or non-homosexual which includes heterosexual, asexual, bisexual, pansexual, and multiple responses.

Transition

Participants were asked for their age and the year that they first sought care to transition, sources that encouraged them to believe that transition would be helpful to them, and whether they felt pressured to transition. The friendship group dynamics that were identified in previous work were assessed by asking respondents whether their friendship group mocked people who were not transgender, whether people in their pre-existing friend group transitioned before the participant decided to transition, and how participant popularity changed after announcing that they would transition (Littman, 2018). Questions were asked about participant experiences with clinicians, the social, medical, and surgical steps they took to transition, and the duration of time spent taking each medication.

Detransition

Participants were asked for their age and the year that they decided to detransition, how long they were transitioned before deciding to detransition, their reasons for wanting to detransition, what sources encouraged them to believe that detransition would be helpful to them, and whether they felt pressured to detransition. Participants were also asked which social, medical, and surgical steps they took to detransition and whether they contacted the doctor or clinic that they used for their transition to tell them that they detransitioned.

Transition and Detransition Narratives

In this article, "narratives" denote participant interpretations of their experiences and rationales surrounding their decisions to transition and detransition. To associate each participant survey with a set of relevant narratives, the data were reviewed with horizontal (beginning to end) passes and vertical passes for selected questions (these questions are listed in the supplemental materials). Surveys were coded as belonging to zero or more of the following narrative categories: discrimination, nonbinary, retransition, trauma and mental health, internalized homophobia, social influence, and misogyny. Each narrative and the responses that were associated with them are detailed below. Example quotes were selected with care taken to avoid quoting a participant more than once per narrative. Narratives are ordered and reported with the more commonly accepted narratives first and the newer narratives next.

The *discrimination* narrative was defined as when someone detransitioned due to experiencing discrimination or external social pressures. The *nonbinary* narrative consisted of answering that their current identification was "nonbinary/genderqueer" or providing open-text responses that described aspects of discovering or maintaining a nonbinary identification. Although there were no questions in the survey specifically asking about retransition, the *retransition* narrative was identified if participants expressed that they had retransitioned or resumed transition in any of the open-text responses in the survey. The *gender dysphoria was caused by trauma or a mental health condition* narrative was identified by selection for the answers, "what I thought were feelings of being transgender were actually the result of trauma," "what I thought were feelings of being transgender were actually the result of a mental health condition," "I discovered that my gender dysphoria was caused by something specific (ex. trauma, abuse, mental health condition)" or open-text responses consistent with these reasons. The *internalized homophobia/difficulty accepting oneself as a lesbian female, gay male, or bisexual person* narrative consisted of descriptions that the respondents' discomfort and distress about being lesbian, gay, or bisexual was related to their gender dysphoria, transition, or detransition, or that they assumed they were transgender because they did not yet understand themselves to be lesbian, gay or bisexual. The *social pressure to transition* narrative was identified with an affirmative

answer to whether they felt pressured to transition with an open-text response indicating that the pressure came from a person or group of people. The *misogyny* narrative was identified for natal female respondents with open-text responses using the word "misogyny" or expressing a hatred of femaleness.

Gender Identification at Start of Transition and at Survey Completion

Participants were asked how they identified their gender when they started their transition and at the time of survey completion. They were given options of female, male, nonbinary/genderqueer, trans man/FTM, trans woman/MTF, none of the above, and other. Responses were coded by natal sex and categorized as transgender, birth sex, nonbinary, and other. Answers that were combinations of the above categories were reported as combinations such as "birth sex and nonbinary."

Self-Appraisal of Transition and Detransition

One question asked if participants believe they were helped and another if they were harmed by their transition with options of "very much," "a little," or "not at all." These results were categorized into exclusively helped, exclusively harmed, and both helped and harmed. Participants were asked which of the following reflected their feelings about their transition: "I am glad that I transitioned," "I wish I had never transitioned," "Transitioning distracted me from what I should have been doing," "Transition was a necessary part of my journey." Participants were asked to rate their regret about their transition ("no regrets," "mild regrets," "strong regrets," and "very strong regrets") and were asked to indicate their satisfaction with their decisions to transition and detransition ("extremely satisfied," "very satisfied," "somewhat satisfied," "somewhat dissatisfied," "very dissatisfied," and "extremely dissatisfied"). Satisfaction options were collapsed into "satisfied" and "dissatisfied." In addition, participants were asked if they knew then what they know now, would they have chosen to transition.

Data Analysis

After data were cleaned, statistical analyses were performed using google sheets. Results are presented as frequencies, percentages, medians, means and standard deviations. *t* tests and chi-square tests were performed for selected variables and were considered significant for $p < .05$. Qualitative data were obtained from the open-text answers to questions that allowed participants to provide additional information. Selected open-text responses were categorized, tallied, and reported numerically. Salient respondent quotes and summaries from the qualitative data were selected to illustrate the quantitative results and to provide relevant examples.

Results

Before Transition

Mental health diagnoses and traumatic experiences before the onset of gender dysphoria. Table 2 shows data about psychiatric disorders, neurodevelopmental disabilities, NSSI, and trauma that were reported as occurring prior to the onset of gender dysphoria. Because these conditions and events occurred before participants began to feel gender dysphoric, they cannot be considered to be secondary to gender incongruence or transphobia.

Gender dysphoria onset and typology. Most participants (82.0%) were living with one or both parents when they first experienced gender dysphoria at a mean age of 11.2 years (SD = 5.6). The mean age of gender dysphoria onset was not statistically different between natal females ($M = 11.3$; SD = 5.4) and natal males ($M = 11.0$; SD = 5.9), $t(96) = 0.25$. By Blanchard typologies, 26.1% of natal females were exclusively homosexual and 73.9% non-homosexual while 6.5% of natal males were exclusively homosexual and 93.5% non-homosexual (Blanchard, 1985, 1989). Slightly more than half of the respondents (56.0%) experienced early-onset gender dysphoria and slightly less than half (44.0%) experienced late-onset gender dysphoria. Although late-onset gender dysphoria in natal females was largely absent from the scientific literature prior to 2012 (Steensma et al., 2013; Zucker & Bradley, 1995; Zucker et al., 2012a), 55.1% of the natal female participants reported that their gender dysphoria began with puberty or later. Because the information about the timing of gender dysphoria onset was obtained from participants reporting on their own experiences, it can be assumed that these cases were indeed late-onset rather than early-onset gender dysphoria that was concealed from parents and other people.

Transition reasons. Table 3 shows data about the reasons that individuals wanted to transition and the most frequently endorsed were: wanting to be perceived as the target gender (77.0%); believing that transitioning was their only option to feel better (71.0%); the sensation that their body felt wrong the way it was (71.0%), and not wanting to be associated with their natal sex (70.0%). Most participants believed that transitioning would eliminate (65.0%) or decrease (63.0%) their gender dysphoria and that with transitioning they would become their true selves (64.0%).

Sources of transition encouragement and friend group dynamics. Participants identified sources that encouraged them to believe transitioning would help them. Social media and online communities were the most frequently reported, including YouTube transition videos (48.0%), blogs (46.0%), Tumblr (45.0%), and online communities (43.0%) (see supplemental materials). Also common were people who the respondents knew offline such as therapists (37.0%); someone (28.0%) or a group of friends (27.0%) that they knew in-person. A subset of

Table 2 Mental health diagnoses and traumatic experiences prior to the onset of gender dysphoria

	Natal female *N* (%) *N*=69	Natal male *N* (%) *N*=31
*Diagnosed with a mental illness or neurodevelopmental disability**[a]		
Depression	27 (39.1%)	5 (16.1%)
Anxiety	22 (31.9%)	5 (16.1%)
Attention deficit hyperactivity disorder (ADHD)	10 (14.5%)	2 (6.5%)
Post-traumatic stress disorder (PTSD)	10 (14.5%)	1 (3.2%)
Eating disorders	10 (14.5%)	0 (0%)
Autism spectrum disorders	9 (13.0%)	1 (3.2%)
Bipolar disorder	9 (13.0%)	0 (0%)
Obsessive compulsive disorder	6 (8.7%)	3 (9.7%)
Borderline personality disorder	5 (7.2%)	0 (0%)
Schizophrenia or other psychotic disorders	1 (1.4%)	0 (0%)
None of the above	28 (40.6%)	17 (54.8%)
Other	7 (10.1%)	2 (6.5%)
Non-suicidal self-injury (NSSI)[b]		
Engaged in NSSI before the onset of gender dysphoria	19 (27.5%)	5 (16.1%)
Trauma[c]		
Experienced a trauma less than one year before the start of gender dysphoria	33 (47.8%)	4 (12.9%)

*May select more than one answer

[a]Natal sex difference for one or more pre-existing diagnoses (100-none of the above) was not significant [$\chi^2(1, 100)=1.76$]

[b]Natal sex differences for NSSI before the onset of gender dysphoria was not significant ($\chi^2=1.52$)

[c]Experiencing a trauma less than one year before the start of gender dysphoria was statistically different [$\chi^2(1, 100)=11.19, p<.001$] with natal females > natal males

Table 3 Transition reasons

	Natal female *N* (%) *N*=69	Natal male *N* (%) *N*=31
*Reasons for transition**		
I wanted others to perceive me as the target gender	53 (76.8%)	24 (77.4%)
I thought transitioning was my only option to feel better	50 (72.5%)	21 (67.7%)
My body felt wrong to me the way it was	50 (72.5%)	21 (67.7%)
I didn't want to be associated with my natal sex/natal gender	51 (73.9%)	19 (61.3%)
It made me uncomfortable to be perceived romantically/sexually as a member of my natal sex/natal gender	49 (71.0%)	18 (58.1%)
I thought transitioning would eliminate my gender dysphoria	43 (62.3%)	22 (71.0%)
I felt I would become my true self	42 (60.9%)	22 (71.0%)
I identified with the target gender	40 (58.0%)	24 (77.4%)
I thought transitioning would lessen my gender dysphoria	45 (65.2%)	18 (58.1%)
I felt I would fit in better with the target gender	36 (56.5%)	20 (64.5%)
I felt I would be more socially acceptable as a member of the target gender	38 (55.1%)	11 (35.5%)
I felt I would be treated better if I was perceived as the target gender	35 (50.7%)	14 (45.2%)
I saw myself as a member of the target gender	31 (44.9%)	18 (58.1%)
I thought transitioning would reduce gender-related harassment or trauma I was experiencing	35 (50.7%)	5 (16.1%)
I had erotic reasons for wanting to transition	9 (13.0)	12 (38.7%)
Other	9 (13.0%)	3 (9.7%)

*May select more than one answer

participants experienced the friendship group dynamics identified in previous work, including belonging to a friendship group that mocked people who were not transgender (22.2%), having one or more friend from the pre-existing friend group transition before the participant decided to transition (36.4%), and experiencing an increase in popularity after announcing plans to transition (19.6%) (Littman, 2018). Most did not have this experience (68.7%, 61.6%, and 62.9%, respectively).

Pressure to transition. More than a third of the participants (37.4%) felt pressured to transition. Natal sex differences in feeling pressured to transition were significant by chi-square test with natal females > natal males $\chi^2(1, 99) = 4.22$, $p = .04$. Twenty-eight participants provided open-text responses of which 24 described sources of pressure (17 described social pressures and 7 described sources that were not associated with other people). Clinicians, partners, friends, and society were named as sources that applied pressure to transition, as seen in the following quotes: "My gender therapist acted like it [transition] was a panacea for everything;" "[My] [d]octor pushed drugs and surgery at every visit;" "I was dating a trans woman and she framed our relationship in a way that was contingent on my being trans;" "A couple of later trans friends kept insisting that I needed to stop delaying things;" "[My] best friend told me repeatedly that it [transition] was best for me;" "The forums and communities and internet friends;" "By the whole of society telling me I was wrong as a lesbian;" and "Everyone says that if you feel like a different gender…then you just are that gender and you should transition." Participants also felt pressure to transition that did not involve other people as illustrated by the following: "I felt pressured by my inability to function with dysphoria" and "Not by people. By my life circumstances."

Experiences with clinicians. When participants first sought care for their gender dysphoria or desire to transition, more than half of the participants (53.0%) saw a psychiatrist or psychologist; about a third saw a primary care doctor (34.0%) or a counselor (including licensed clinician social worker, licensed professional counselor, or marriage and family therapist) (32.0%); and 17.0% saw an endocrinologist. For transition, 45.0% of participants went to a gender clinic (44.4% of those attending a gender clinic specified that the gender clinic used the informed consent model of care); 28.0% went to a private doctor's office; 26.0% went to a group practice; and 13.0% went to a mental health clinic (see supplemental materials).

The majority (56.7%) of participants felt that the evaluation they received by a doctor or mental health professional prior to transition was not adequate and 65.3% reported that their clinicians did not evaluate whether their desire to transition was secondary to trauma or a mental health condition. Although 27.0% believed that the counseling and information they received prior to transition was accurate about benefits and risks, nearly half reported that the counseling was overly positive about the benefits of transition (46.0%) and not negative enough about the risks (26.0%). In contrast, only a small minority found the counseling not positive enough about benefits (5.0%) or too negative about risks (6.0%) suggesting a bias toward encouraging transition.

Transition

Participants were on average 21.9 years old (SD = 6.1) when they sought medical care to transition with natal females seeking care at younger ages ($M = 20.0$; SD = 4.2) than natal males ($M = 26.0$; SD = 7.5), $t(97) = -5.07$, $p < .001$. Given that the majority of natal males were categorized as Blanchard typology non-homosexual, the finding that natal males sought medical care to transition at older ages than natal females is concordant with previous research (Blanchard et al., 1987). The average year for seeking care was more recent for natal females ($M = 2011$; SD = 3.8) than natal males ($M = 2007$; SD = 6.9), $t(96) = 2.78$, $p = .007$, and thus, there may have been differences in the care they received due to differences in the culture surrounding transition and the prevailing medical approaches to gender dysphoria for the time.

At the start of transitioning, nearly all (98.0%) of the participants identified as either transgender (80.0%), nonbinary (15.0%), or both transgender and nonbinary (3.0%). Participants identified which social, medical, and surgical steps they had taken to transition. Table 4 shows these steps, separated by natal sex where appropriate. Most respondents adopted new pronouns (91.0%) and names (88.0%), and the vast majority (97.1%) of natal females wore a binder. Most participants took cross-sex hormones (96.0%) and most natal males took anti-androgens (87.1%). The most frequent transition surgery was breast or chest surgery for natal females (33.3%). Genital surgery was less common (1.4% of natal females and 16.1% of natal males). Natal females took testosterone for a mean duration of 2.0 years (SD = 1.6). Natal males took estrogen for a mean duration of 5.1 years (SD = 5.9) and anti-androgens for 2.8 years (SD = 2.6). The minority of patients who took puberty blockers took them for a mean duration of less than a year ($M = 0.9$ years; SD = 0.6).

Detransition

Before deciding to detransition, participants remained transitioned for a mean duration of 3.9 years (SD = 4.1) with natal females remaining transitioned for a shorter period of time ($M = 3.2$ years; SD = 2.7) than natal males ($M = 5.4$ years; SD = 6.1), $t(96) = -2.40$, $p = .018$. When participants decided to detransition they were a mean age of 26.4 years old (SD = 7.4) though natal females were significantly younger ($M = 23.6$; SD = 4.5) than natal males ($M = 32.7$; SD = 8.8), $t(97) = -6.75$, $p < .001$. The mean calendar year when participants decided to detransition was 2014 ($M = 2014$; SD = 3.3), but the difference

Table 4 Steps taken for social, medical, and surgical transition

	N (%)
*Social transition**	
Pronouns	91 (91.0%)
Different name	88 (88.0%)
Clothes/hair/makeup	90 (90.0%)
Legal name change	49 (49.0%)
Gender/sex changed on government documents	36 (36.0%)
Voice training	20 (20.0%)
Natal female	
Wore a binder	67 (97.1%)
*Medical transition**	
Cross-sex hormones	96 (96.0%)
Puberty blockers	7 (7.0%)
Natal male	
Anti-androgens	27 (87.1%)
*Surgical transition**	
Face/neck surgery	5 (5.0%)
Natal female	
Breast/chest surgery	23 (33.3%)
Genital surgery (to create a penis)	1 (1.4%)
Natal male	
Breast implants	5 (16.1%)
Genital surgery (to create a vagina)	5 (16.1%)

*May select more than one answer

between natal females and natal males was not significant ($M=2014$, SD = 3.3; $M=2014$, SD = 3.5), $t(95)=0.52$.

Respondents detransitioned for a variety of reasons and most (87.0%) selected more than one reason. The most frequently endorsed reason for detransitioning was that the respondent's personal definition of male and female changed and they became comfortable identifying with their natal sex (60.0%) (see Table 5). Other commonly endorsed reasons were concerns about potential medical complications (49.0%); transition did not improve their mental health (42.0%); dissatisfaction with the physical results of transition (40.0%); and discovering that something specific like trauma or a mental health condition caused their gender dysphoria (38.0%). External pressures to detransition such as experiencing discrimination (23.0%) or worrying about paying for treatments (17.0%) were less common.

Encouragement and pressure to detransition. Participants were asked to select sources that encouraged them to believe that detransitioning would help them. These included blogs (37.0%), Tumblr (35.0%), and YouTube detransition videos (23.0%) (see supplemental materials). At some point in their process, 23.2% felt pressured to detransition. There was no significant difference between natal females and natal males for feeling pressured to detransition, $\chi^2(1, 99)=1.11$. Of the 21 open-text responses provided, 14 respondents expressed social pressure to detransition; three expressed internal pressure to detransition and four provided responses that were neither

Table 5 Reasons for detransitioning

	Natal female *N* (%) *N*=69	Natal male *N* (%) *N*=31
*Reasons for detransitioning**		
My personal definition of female or male changed and I became more comfortable identifying as my natal sex	45 (65.2%)	15 (48.4%)
I was concerned about potential medical complications from transitioning	40 (58.0%)	9 (29.0%)
My mental health did not improve while transitioning	31 (44.9%)	11 (35.5%)
I was dissatisfied by the physical results of the transition/felt the change was too much	35 (50.7%)	5 (16.1%)
I discovered that my gender dysphoria was caused by something specific (ex, trauma, abuse, mental health condition)	28 (40.6%)	10 (32.3%)
My mental health was worse while transitioning	27 (39.1%)	9 (29.0%)
I was dissatisfied by the physical results of the transition/felt the change was not enough	22 (31.9%)	11 (35.5%)
I found more effective ways to help my gender dysphoria	25 (36.2%)	7 (22.6%)
My physical health was worse while transitioning	21 (30.4%)	11 (35.5%)
I felt discriminated against	12 (17.4%)	11 (35.5%)
I had medical complications from transitioning	12 (17.4%)	7 (22.6%)
Financial concerns about paying for transition care	11 (15.9%)	6 (19.4%)
My gender dysphoria resolved	10 (14.5%)	5 (16.1%)
My physical health did not improve while transitioning	9 (13.0%)	2 (6.5%)
I resolved the specific issue that was the cause of my gender dysphoria	6 (8.7%)	4 (12.9%)
I realized that my desire to transition was erotically motivated	1 (1.4%)	5(16.1%)
Other	19 (27.5%)	6 (19.4%)

*May select more than one answer

or unclear. Regarding social pressure to detransition, seven participants expressed that the pressure came from partners, parents, or other family members as shown in the following example quotes: "I was threatened that if I did not immediately detransition I would NEVER see my [...] children again," "My father very much wanted me to desist," and "Parents constantly encouraging me to detransition." Five participants expressed societal pressure to detransition as expressed in the following quotes: "I did not pass, I was mocked in public, I could not get a job. It was not ok to be trans" and "Well, I mean basically the entire world was against me transitioning, so yeah." One participant felt pressured by doctors and another one from a blog.

Detransition steps. Table 6 shows data about the social, medical, and surgical steps participants took to detransition. Nearly all participants medically detransitioned by ceasing cross-sex hormones (95.0%). Social detransition steps were also common and included returning to the use of previously used pronouns (63.0%) and birth names (33.0%) and changing one's clothes and hair presentations (48.0%). Surgical detransition steps were less common (9.0%).

Finding better ways of coping with gender dysphoria. Participants were asked to select responses that that they considered to have been better ways for them to cope with their gender dysphoria. Responses included community (44.0%), mindfulness/meditation (41.0%), exercise (39.0%), therapy (24.0%), trauma work (24.0%), medication to treat a mental health condition (18.0%), and yoga (14.0%).

Table 6 Social, medical, and surgical detransition steps

	N (%)
*Social detransition**	
Previous pronouns	63 (63.0%)
Clothes/hair/makeup	48 (48.0%)
Birth name	33 (33.0%)
New name (not birth name)	24 (24.0%)
None of the above	2 (2.0%)
*Medical detransition**	
Stopped cross-sex hormones	95 (95.0%)
Stopped puberty blockers	4 (4.0%)
Started hormones consistent with natal sex	14 (14.0%)
Natal male	
Stopped anti-androgens	17 (54.8%)
*Surgical detransition**	
Surgery to reverse changes from transition	9 (9.0%)

*May select more than one answer

Transition and Detransition Narratives

Several transition and detransition narratives emerged from the data. A sizable minority of participants (41.0%) expressed more than one narrative in their responses.

The *discrimination and external pressures to detransition* narrative was described by 29.0% of participants. Examples include: "I had to detransition in order to get a job"; "I was afraid of being homeless and unable to support myself"; "I felt much happier with myself but I couldn't go anywhere without being afraid. I passed okay but not perfectly. I was stared down and sneered at in the women's clothes section, I wouldn't dare use a public toilet because I'd find either violent men or women who wished an encounter with a violent man on me."

A *nonbinary* narrative was expressed by 16.0% of participants. Some described that they discovered their nonbinary gender identity during their transition, as in the following quotes: "I still was uncomfortable with my body and figured I should stop and make sure I really wanted to keep going. I didn't and I decided I must be nonbinary, not FTM"; "Transitioning didn't do what I thought I wanted it to. I had transitioned to the wrong gender. I still felt wrong. Then, I realized I was not male, but genderqueer. I detransitioned to suit my true identity." And others described a consistent nonbinary identification, as in the following quote, "I identified the same way that I did before. I had gotten what I wanted out of HRT and was ready to stop taking it." (Cross-sex hormones are sometimes referred to as "hormone replacement therapy" and abbreviated as HRT).

Three participants (3.0%) expressed the *retransition* narrative in open-text answers indicating that they had retransitioned, including the following quotes: "I am now transitioning for a second time"; I retransitioned after 5 years of detransitioning"; and "Anyway, I retransitioned over 10 years after detransitioning."

Most participants (58.0%) expressed the *gender dysphoria was caused by trauma or a mental health condition* narrative which included endorsing the response options indicating that their gender dysphoria was caused by something specific, such as a trauma or a mental health condition. More than half of the participants (51.2%) responded that they believe that the process of transitioning delayed or prevented them from dealing with or being treated for trauma or a mental health condition. The following are example quotes that were in response to why participants chose to detransition: "I slowly began addressing the mental health conditions and traumatic experiences that caused such a severe disconnect between myself and my body..."; "I was starting to become critical of transition because I felt that many people were doing it out of self-hatred and started to realize that applied to me as well"; "I was deeply uncomfortable with my secondary sex characteristics, which I now understand was a result of childhood trauma and associating my secondary sex characteristics with those events."

Despite the absence of any questions about this topic in the survey, nearly a quarter (23.0%) of the participants expressed the *internalized homophobia and difficulty accepting oneself as lesbian, gay, or bisexual* narrative by spontaneously describing that these experiences were instrumental to their gender dysphoria, their desire to transition, and their detransition. All

of the participants in this category indicated that they were either same-sex attracted exclusively or were same-sex attracted in combination with opposite-sex attraction (such as bisexual, pansexual, etc.). The following responses were written in as "other" for the question about why participants transitioned: "Transitioning to male would mean my attraction to girls would be 'normal'"; "being a 'gay trans man' (female dating other females) felt better than being a lesbian, less shameful"; "I felt being the opposite gender would make my repressed same-sex attraction less scary"; "I didn't want to be a gay man." Some participants described that it took time for them to gain an understanding of themselves as lesbian, gay, or bisexual as seen in the following: "At the time I was trying to figure out my identity and felt very male and thought I was transgender. I later discovered that I was a lesbian…"; and "Well, after deep discovery, I realized I was a gay man and realized that a sexual trauma after puberty might [have] confused my thought. I wanted to live as a gay man again." Several natal female respondents expressed that seeing other butch lesbians would have been helpful to them as shown by the following: "What would have helped me is being able to access women's community, specifically lesbian community. I needed access to diverse female role-models and mentors, especially other butch women."

The *social influence* narrative was identified where participants added information to the question about if they had felt pressured to transition and the response described pressure from a person or people. One-fifth (20.0%) of participants expressed that they felt pressured by a person or people to transition. Example quotes for social influence were described in a previous section.

Of the natal females, 7.2% expressed the *misogyny* narrative. Example quotes include: "…I realized how much of it [dysphoria] may have been caused by internalized misogyny and homophobia"; "Finally realizing there's nothing wrong or disgusting or weak about being female"; and "My transition was a desperate attempt to distance myself from womanhood and femaleness due to internalized lesbophobia and misogyny combined with a history of sexual trauma."

After Detransition

Disposition. At the time of survey completion, most participants had returned to identifying solely as their birth sex (61.0%) with an additional 10.0% identifying as their birth sex plus another identification. Fourteen percent of the participants identified solely as nonbinary with an additional 11.0% identifying as nonbinary plus a second identification. Eight percent of the participants identified solely as transgender with an additional 5.0% identifying as transgender plus another identification. Four percent of the responses did not fit into the above categories and were coded as "other." Figure 1 illustrates the distribution of participants' current gender identification (post-detransition). Only 24.0% of participants had informed

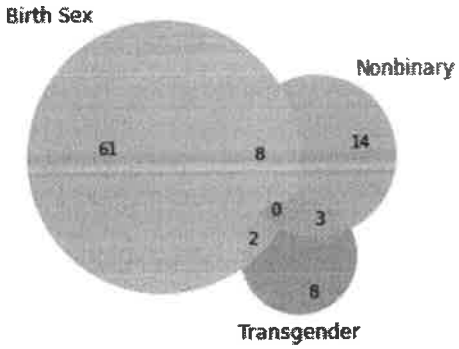

Fig. 1 Distribution of participants' current gender identification (after detransition) (n = 100). *Notes*: The sum of the numbers appearing in the "Birth Sex" circle indicates the number of participants who returned to identifying with their birth sex (71)—either as birth sex alone (61) or birth sex in addition to a second identification (10) represented in the overlap between two circles. For example, eight participants identify as their birth sex and as nonbinary. The sum of the numbers appearing in the "Nonbinary" circle indicates the number of participants who identify as nonbinary (25)—either as nonbinary alone (14) or nonbinary in addition to a second identification (11). The sum of the numbers appearing in the "Transgender" circle indicates the number of participants who identify as transgender (13)—either as transgender alone (8) or transgender in addition to a second identification (5). Four participants had responses that did not fit the categories above and were coded as "other"

the doctor or clinic that facilitated their transitions that they had detransitioned.

Self-appraisal of past transgender identification. Table 7 presents the data for responses endorsed by participants to reflect how they feel currently about having identified as transgender in the past. The statements most frequently selected included: "I thought gender dysphoria was the best explanation for what I was feeling" (57.0%), "My gender dysphoria was similar to the gender dysphoria of those who remain transitioned" (42.0%), "What I thought were feelings of being transgender actually were the result of trauma" (36.0%), "What I thought were feelings of being transgender actually were the result of a mental health condition" (36.0%).

Self-appraisal of transition and detransition. When asked to select which statement best reflects their feelings about their transition, nearly a third (30.0%) indicated that they wish they had never transitioned while 11.0% indicated they were glad they transitioned. Some (34.0%) selected the statement that transition "was a necessary part of [their] journey" but others (21.0%) indicated that the process of transitioning distracted them from what they should have been doing. Responses about whether transition helped or harmed them were also complicated. While 50.5% selected answers consistent with being both helped and harmed, 32.3% indicated that they were only harmed and 17.2% indicated that they were only helped. The majority of respondents were dissatisfied with their decision to transition (69.7%) and satisfied with their decision to detransition (84.7%). At least some amount of transition regret was

Table 7 Self-appraisal of past transgender identification

	Natal female *N* (%) *N*=69	Natal male *N* (%) *N*=31
*Self-appraisal about identifying as transgender in the past**		
I thought gender dysphoria was the best explanation for what I was feeling	39 (56.5%)	18 (58.1%)
My gender dysphoria was similar to the gender dysphoria of those who remain transitioned	32 (46.4%)	10 (32.3%)
What I thought were feelings of being transgender actually were the result of trauma	31 (44.9%)	5 (16.1%)
What I thought were feelings of being transgender actually were the result of a mental health condition	28 (40.6%)	8 (25.8%)
Someone else told me that the feelings I was having meant that I was transgender and I believed them	25 (36.2%)	10 (32.3%)
I still identify as transgender	20 (29.0%)	10 (32.3%)
I believed I was transgender then, but I was mistaken	16 (23.2%)	6 (19.4%)
I was transgender then but I am not transgender now	15 (21.7%)	7 (22.6%)
I formerly identified as transgender and now identify as genderqueer/nonbinary	12 (17.4%)	5 (16.1)
My gender dysphoria was different from the gender dysphoria of those who remain transitioned	11 (15.9%)	4 (12.9%)
I was never transgender	8 (11.6%)	3 (9.7%)
I thought I had gender dysphoria but I was mistaken	4 (5.8%)	4 (12.9%)
I never had gender dysphoria	1 (1.4)	2 (6.5%)
N/A as I did not identify as transgender in the past	0 (0%)	1 (3.2%)
Other	18 (26.1%)	5 (16.1%)

*May select more than one answer

common (79.8%) and nearly half (49.5%) reported strong or very strong regret. Most respondents (64.6%) indicated that if they knew then what they know now, they would not have chosen to transition.

Discussion

This study was designed to explore the experiences of individuals who obtained medical and surgical treatment for gender dysphoria and then detransitioned by discontinuing the medications or having surgery to reverse the changes from transition. The findings of this study, however, should not be assumed to be representative of all individuals who detransition. Although this study further documents that detransitioners exist, the prevalence of detransition as an outcome of transition is unknown. Only a small percentage of detransitioners (24.0%) informed the clinicians and clinics that facilitated their transitions that they had detransitioned. Therefore, clinic rates of detransition are likely to be underestimated and gender transition specialists may be unaware of how many of their own patients have detransitioned, particularly for patients who are no longer under their care.

This research demonstrates that the experiences of individuals who detransition are varied and the reasons for detransition are complex. Nearly all participants identified as transgender or nonbinary at the start of their transition and most sought transition because they did not want to be associated with their natal sex, their bodies felt wrong the way they were, and they believed that transition was the only option to relieve their distress. Some were helped by transition and only detransitioned because they were pressured to do so by people in their lives, society, or because they had medical complications. Some were harmed by transition and detransitioned because they concluded that their gender dysphoria was caused by trauma, a mental health condition, internalized homophobia, or misogyny—conditions that are not likely to be resolved with transition. These findings highlight the complexity of gender dysphoria and suggest that, in some cases, failure to explore co-morbidities and the context in which the gender dysphoria emerged can lead to misdiagnosis, missed diagnoses, and inappropriate gender transition. Some individuals detransitioned because their gender dysphoria resolved, because they found better ways to address their symptoms, or because their personal definitions of male and female changed and they became comfortable identifying as their natal sex.

The study sample was predominantly young natal females, many of whom experienced late-onset gender dysphoria which mirrors the recent, striking changes in the demographics of gender dysphoric youth seeking care as well as the youth described by their parents in Littman (2018) (see also Aitken et al., 2015; de Graaf et al., 2018; Zucker, 2019). Concerns have been raised that this new cohort of gender dysphoric individuals is unlike previous cohorts. Professionals have started to call for caution before treating this cohort with interventions with permanent effects because the etiologies, desistance and persistence rates,

expected duration of symptoms, and whether this new population is helped or harmed by gender transition is still unknown (D'Angelo et al., 2021; Kaltiala-Heino et al., 2018). The natal females and natal males in this sample differed on several dimensions, including that natal females were younger than natal males when they sought transition, when they decided to detransition, and at the time of survey completion. Natal females were more likely than natal males to have experienced a trauma less than one year before the onset of their gender dysphoria and were more likely to have felt pressured to transition. Compared to natal males, natal females remained transitioned for a shorter duration of time before deciding to detransition. Additionally, natal females transitioned more recently than natal males, so their experiences may vary due to changing trends in the clinical management of gender dysphoria and the cultural settings in which they became gender dysphoric.

The study findings covered a wide range of detransition experiences that are consistent with the diversity of experiences described in previously published clinical case reports and case series. Overlap of findings include: transition regret; absence of transition regret; re-identification with birth sex; continued identification as transgender; improvement or worsening of well-being with transition; retransitioning; detransitioning due to external social pressures; nonbinary identification; and recognizing and accepting oneself as homosexual or bisexual (D'Angelo, 2018; Djordjevic et al., 2016; Levine, 2018; Pazos Guerra et al., 2020; Turban & Keuroghlian, 2018; Turban et al., 2021; Vandenbussche, 2021). The population in this study is similar to the population in Vandenbussche in that both were predominantly natal females in their mid-20s. Because the current study recruited in 2016–2017 and Vandenbussche recruited in 2019, the similar mean age of participants may reflect the age of individuals who can be reached in online detransitioner communities. Several findings in this study were consistent with Vandenbussche's findings, including similar reasons for detransition (realizing that their gender dysphoria was related to other issues, finding alternatives to address gender dysphoria, gender dysphoria resolved, etc.). Although these two studies were recruited in different years, had different eligibility criteria, and included participants from several countries, it is possible that there may be some overlap of study populations.

The current study findings provide additional insight into the complex relationships between internalized homophobia, gender dysphoria, and desire to transition. Contrary to arguments against the potential role of homophobia in gender transitions (Ashley, 2020), participants reported that their own gender dysphoria and desire to transition stemmed from the discomfort they felt about being same-sex attracted, their desire to not be gay, and the difficulties that they had accepting themselves as lesbian, gay or bisexual. For these individuals, exploring their distress and discomfort around sexual orientation issues may have been more helpful to them than medical and surgical transition or at least an important part of exploration before making the decision to transition. This research adds to the existing evidence that gender dysphoria can be temporary (Ristori & Steensma, 2016; Singh et al., 2021; Zucker, 2018). It has been established that the most likely outcome for prepubertal youth with gender dysphoria is to develop into lesbian, gay, bisexual (LGB) (non-transgender) adults (Ristori & Steensma, 2016; Singh et al., 2021; Wallien & Cohen-Kettenis, 2008; Zucker, 2018). And, temporary gender dysphoria may be a common part of LGB identity development (Korte et al., 2008; Patterson, 2018). Therefore, intervening too soon to medicalize gender dysphoric youth risks iatrogenically derailing the development of youth who would otherwise grow up to be LGB non-transgender adults. Participants who detransitioned because they became comfortable identifying as their natal sex and because their gender dysphoria resolved further support that gender dysphoria is not always permanent.

The data in this study strengthen, with first-hand accounts, the rapid-onset gender dysphoria (ROGD) hypotheses which, briefly stated, are that psychosocial factors (such as trauma, mental health conditions, maladaptive coping mechanisms, internalized homophobia, and social influence) can cause or contribute to the development of gender dysphoria in some individuals (Littman, 2018). Littman also postulated that certain beliefs could be spread by peer contagion, including the belief that a wide range of symptoms should be interpreted as gender dysphoria (and proof of being transgender) and the belief that transition is the only solution to relieve distress. The current study supports the potential role of psychosocial factors in the development of gender dysphoria and further suggests, by participant responses that transitioning prevented or delayed them from addressing their underlying conditions, that maladaptive coping mechanisms may be relevant for some individuals. The potential role of social influence is demonstrated as well. First, when respondents were asked to describe how they currently feel about having identified as transgender in the past, more than a third endorsed the option, "Someone told me that the feelings I was having meant that I was transgender, and I believed them." Second, a subset of participants experienced the unique friendship group dynamics reported in Littman where peer groups mocked people who were not transgender and popularity within the friend group increased when respondents announced their plan to transition. Additionally, respondents identified several social sources that encouraged them to believe that transitioning would help them including: YouTube transition videos, blogs, Tumblr, and online communities. And finally, 20.0% of participants felt pressured to transition by social sources that included friends, partners, and society. More research is needed to further explore these hypotheses.

The current study and the Turban et al. (2021) analysis of the USTS data share some similarities and differences. Similarities include the use of convenience samples, targeted recruitment, and anonymous data collection. The findings of Turban et al. (including external pressures to detransition and transgender

identification after detransition) are a subset of the array of experiences described in the current study. The current study differed from James et al. (2016) and Turban et al. in that it enrolled participants based on the criterion of detransition after medical or surgical transition regardless of how they currently identified, recruited from communities with diverse perspectives about transition and detransition, used a precise definition for detransition that specifies the use of medication or surgery, and included answer options that were relevant to many different types of detransition experiences. In contrast, the USTS only enrolled transgender-identifying individuals regardless of whether they medically or surgically transitioned, recruited from communities likely to have similar perspectives about transition and detransition, and provided multiple choice answer options that were relevant to a narrower range of detransition experiences (James et al., 2016). Further, the definition used by the USTS for "detransitioned" (having "gone back to living as [their] sex assigned as birth, at least for a while") is quite vague. Although Turban et al. provide valuable information about the subset of transgender-identifying people who may have detransitioned, the current study provides a more comprehensive view of individuals who detransition after medical or surgical transition.

Over the past 15 years, there have been substantial changes in the clinical approach to gender dysphoric patients notable for a shift from approaches that employ thorough evaluations and judicious use of medical and surgical transition (the watchful waiting or Dutch approach, the developmentally informed approach, and the medical model of care) to approaches with minimized or eliminated evaluation and liberal use of transition interventions (the affirmative approach and the informed consent model of care) (Cavanaugh et al., 2016; de Vries & Cohen-Kettenis, 2012; Meyer et al., 2002; Rafferty et al., 2018; Schulz, 2018; Zucker et al., 2012b). This trend is prominent in the U.S. where the American Academy of Pediatrics endorsed the affirmative approach in 2018 and Planned Parenthood currently uses the informed consent model to provide medical transition in more than 200 clinics in 35 states (Planned Parenthood, 2021; Rafferty et al., 2018). It is plausible that an unintended consequence of these clinical shifts may be an increase in people who detransition. Many participants in this study believe that they did not receive an adequate evaluation by a clinician before transition. The definition of "adequate evaluation" was not provided in the survey and may be open to respondent interpretation. But given the complexities of the gender dysphoria described in the current study, one might consider a low bar of "adequate" to be the exploration of factors that could be misinterpreted as non-temporary gender dysphoria as well as factors that could be underlying causes for gender dysphoria. The most recently emerging approach to gender dysphoria is called the "exploratory approach" which is a neutral psychotherapeutic approach to help individuals gain a deeper understanding of their gender distress and the factors contributing to their dysphoria (Churcher Clarke & Spiliadis, 2019; Spiliadis, 2019). The study's findings suggest that an exploratory type of approach may have been beneficial to some of the respondents. Future research is needed to determine which patients are best treated by which approaches long term.

Patients considering medical and surgical interventions deserve accurate information about the risks, benefits, and alternatives to that treatment. In this sample, nearly half of the participants reported that the counseling they received about transition was overly positive about the benefits of transition and more than a quarter reported that the counseling was not negative enough about the risks. Several participants felt pressured to transition by their doctors and therapists. If these types of clinical interactions are verified, exploration is needed to determine the extent to which this situation occurs and what measures might be taken to ensure that clinicians provide patients with their options accurately and dispassionately.

There are several obstacles to obtaining accurate rates of detransition and desistance, including stigma and the low numbers of detransitioners who inform their clinicians that they detransitioned. One approach to bypass some of these barriers would be to incorporate non-judgmental questions about detransition and desistance into nationally representative surveys that collect health data. For example, the Behavioral Risk Factor Surveillance System contains an optional module about sexual orientation and gender identity that includes two questions to explore gender issues (Downing & Przedworski, 2018). By changing one existing question, "Do you consider yourself to be transgender?" into two questions, "Have you ever, at any point in your life, considered yourself to be transgender?" and "Do you currently consider yourself to be transgender?" and by adding a follow-up question if answers indicate past but not current transgender identification, "Did you ever take puberty blockers, cross-sex hormones, anti-androgens, or have any surgery as part of your transition?", valuable information about desistance, detransition, and current transgender identification could be obtained. These types of questions may also be of use in clinical practice and electronic medical records. The information gained about rates of detransition and desistance would enhance transgender healthcare by aiding informed consent processes at the start of any medical or surgical transition.

One of the strengths of this study is that it is one of the largest samples of detransitioners to date. Other strengths include the use of a precise definition for detransition, enrollment of detransitioners regardless of their post-detransition gender identification, recruitment from communities with likely divergent views about transition and detransition, and collaboration with two individuals who had detransitioned which helped to create a survey instrument with questions relevant to a variety of detransition experiences and enhanced the recruitment efforts.

There are several limitations to this study that should be considered when interpreting the findings. Like Vandenbussche (2021), James et al. (2016), and Turban et al. (2021), this study

used a cross-sectional design, anonymous surveying, and a convenience sample and therefore shares the same limitations that are inherent to these methodologies. These limitations include that conclusions about causation cannot be determined, identities of participants cannot be verified, and the findings of this study may not be generalizable to the entire population of people who detransition or to people outside of the countries where participants were from. Although this study reached out to communities with differing perspectives about transition and detransition, targeted recruitment and convenience samples always introduce the limitations associated with selection biases which should be addressed in future research. Finally, many of the participants in this study had less than ideal outcomes to their medical and surgical transitions, and it is possible that these experiences may have colored some of the responses.

Additional research is needed to determine the prevalence of detransition as an outcome of transition and to identify and meet the psychological and medical needs of the emerging detransitioned population. Because many individuals who detransition re-identify with their birth sex, are no longer connected to LGBT communities, and don't return to gender clinics, future research about detransition needs to expand recruitment efforts beyond gender clinics and transgender communities. The development and testing of non-medical interventions for gender dysphoria could provide valuable options to be used as alternatives or in conjunction with medical and surgical treatments. Because of the potential for some to experience trauma, mental health conditions, internalized homophobia, and misogyny as gender dysphoria, research needs to be conducted on the evaluation process before transition to find approaches that respectfully and collaboratively explore factors that might contribute to gender-related distress. There continues to be an absence of long-term outcomes evidence for youth treated with medical and surgical transition and a lack of information about the trajectories of youth experiencing late-onset gender dysphoria–research is needed to address these gaps. Continued work is needed to reduce rigid gender roles, increase representation of gender stereotype nonconformity, and to address discrimination and social pressures exerted against people who are transgender, lesbian, gay, bisexual, and gender stereotype non-conforming.

Conclusion

This study described individuals who, after transitioning with medications or surgery, have detransitioned. The prevalence of detransitioning after transition is unknown but is likely underestimated because most of the participants did not inform the doctors who facilitated their transitions that they had detransitioned. There is no single narrative to explain the experiences of all individuals who detransition and we should take care to avoid painting this population with a broad brush. Some detransitioners return to identifying with their birth sex, some assume (or maintain) a nonbinary identification, and some continue to identify as transgender. Some detransitioners regret transitioning and some do not. Some of the detransitioners reported experiences that support the ROGD hypotheses, including that their gender dysphoria began during or after puberty and that mental health issues, trauma, peers, social media, online communities, and difficulty accepting themselves as lesbian, gay, or bisexual were related to their gender dysphoria and desire to transition. Natal female and natal male detransitioners appear to have differences in their baseline characteristics and experiences and these differences should be further delineated. Future research about gender dysphoria and the outcomes of transition should consider the diversity of experiences and trajectories. More research is needed to determine how best to provide support and treatment for the long-term medical and psychological well-being of individuals who detransition. Findings about detransition should be used to improve our understanding of gender dysphoria and to better inform the processes of evaluation, counseling, and informed consent for individuals who are contemplating transition.

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Declarations

Conflict of interest The author has no relevant financial or non-financial conflicts of interest to disclose.

Consent to Participate Electronic consent was obtained from all participants included in the study. On the first page of the online survey, participants were informed of the research purpose and potential risks and benefits of participating, that their participation was voluntary, and were presented with a way to contact the researcher. The research survey questions were displayed only if the participant clicked "agree" which indicated that the participant read the information, voluntarily agreed to participate, and were at least 18 years of age.

Ethical Approval The research was determined to be Exempt Human Research by the Program for the Protection of Human Subjects of the Icahn School of Medicine at Mount Sinai in New York, NY. All procedures were performed in accordance with the ethical standards of the Program for the Protection of Human Subjects at the Icahn School of Medicine at Mount Sinai and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

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Long-Term Follow-Up of Transsexual Persons Undergoing Sex Reassignment Surgery: Cohort Study in Sweden

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Abstract

Context: The treatment for transsexualism is sex reassignment, including hormonal treatment and surgery aimed at making the person's body as congruent with the opposite sex as possible. There is a dearth of long term, follow-up studies after sex reassignment.

Objective: To estimate mortality, morbidity, and criminal rate after surgical sex reassignment of transsexual persons.

Design: A population-based matched cohort study.

Setting: Sweden, 1973-2003.

Participants: All 324 sex-reassigned persons (191 male-to-females, 133 female-to-males) in Sweden, 1973–2003. Random population controls (10:1) were matched by birth year and birth sex or reassigned (final) sex, respectively.

Main Outcome Measures: Hazard ratios (HR) with 95% confidence intervals (CI) for mortality and psychiatric morbidity were obtained with Cox regression models, which were adjusted for immigrant status and psychiatric morbidity prior to sex reassignment (adjusted HR [aHR]).

Results: The overall mortality for sex-reassigned persons was higher during follow-up (aHR 2.8; 95% CI 1.8–4.3) than for controls of the same birth sex, particularly death from suicide (aHR 19.1; 95% CI 5.8–62.9). Sex-reassigned persons also had an increased risk for suicide attempts (aHR 4.9; 95% CI 2.9–8.5) and psychiatric inpatient care (aHR 2.8; 95% CI 2.0–3.9). Comparisons with controls matched on reassigned sex yielded similar results. Female-to-males, but not male-to-females, had a higher risk for criminal convictions than their respective birth sex controls.

Conclusions: Persons with transsexualism, after sex reassignment, have considerably higher risks for mortality, suicidal behaviour, and psychiatric morbidity than the general population. Our findings suggest that sex reassignment, although alleviating gender dysphoria, may not suffice as treatment for transsexualism, and should inspire improved psychiatric and somatic care after sex reassignment for this patient group.

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Introduction

Transsexualism (ICD-10),[1] or gender identity disorder (DSM-IV),[2] is a condition in which a person's gender identity - the sense of being a man or a woman - contradicts his or her bodily sex characteristics. The individual experiences gender dysphoria and desires to live and be accepted as a member of the opposite sex.

The treatment for transsexualism includes removal of body hair, vocal training, and cross-sex hormonal treatment aimed at making the person's body as congruent with the opposite sex as possible to alleviate the gender dysphoria. Sex reassignment also involves the surgical removal of body parts to make external sexual characteristics resemble those of the opposite sex, so called sex reassignment/confirmation surgery (SRS). This is a unique

intervention not only in psychiatry but in all of medicine. The present form of sex reassignment has been practised for more than half a century and is the internationally recognized treatment to ease gender dysphoria in transsexual persons.[3,4]

Despite the long history of this treatment, however, outcome data regarding mortality and psychiatric morbidity are scant. With respect to suicide and deaths from other causes after sex reassignment, an early Swedish study followed 24 transsexual persons for an average of six years and reported one suicide.[5] A subsequent Swedish study recorded three suicides after sex reassignment surgery of 175 patients.[6] A recent Swedish follow-up study reported no suicides in 60 transsexual patients, but one death due to complications after the sex reassignment surgery.[7] A Danish study reported death by suicide in 3 out of 29 operated male-to-female transsexual persons followed for an average of six years.[8] By contrast, a Belgian study of 107 transsexual persons followed for 4–6 years found no suicides or deaths from other causes.[9] A large Dutch single-centre study (N = 1,109), focusing on adverse events following hormonal treatment, compared the outcome after cross-sex hormone treatment with national Dutch standardized mortality and morbidity rates and found no increased mortality, with the exception of death from suicide and AIDS in male-to-females 25–39 years of age.[10] The same research group concluded in a recent report that treatment with cross-sex hormones seems acceptably safe, but with the reservation that solid clinical data are missing.[11] A limitation with respect to the Dutch cohort is that the proportion of patients treated with cross-sex hormones who also had surgical sex-reassignment is not accounted for.[10]

Data is inconsistent with respect to psychiatric morbidity post sex reassignment. Although many studies have reported psychiatric and psychological improvement after hormonal and/or surgical treatment,[7,12,13,14,15,16] other have reported on regrets,[17] psychiatric morbidity, and suicide attempts after SRS.[9,18] A recent systematic review and meta-analysis concluded that approximately 80% reported subjective improvement in terms of gender dysphoria, quality of life, and psychological symptoms, but also that there are studies reporting high psychiatric morbidity and suicide rates after sex reassignment.[19] The authors concluded though that the evidence base for sex reassignment "is of very low quality due to the serious methodological limitations of included studies."

The methodological shortcomings have many reasons. First, the nature of sex reassignment precludes double blind randomized controlled studies of the result. Second, transsexualism is rare [20] and many follow-ups are hampered by small numbers of subjects.[5,8,21,22,23,24,25,26,27,28] Third, many sex reassigned persons decline to participate in follow-up studies, or relocate after surgery, resulting in high drop-out rates and consequent selection bias.[6,9,12,21,24,28,29,30] Forth, several follow-up studies are hampered by limited follow-up periods.[7,9,21,22,26,30] Taken together, these limitations preclude solid and generalisable conclusions. A long-term population-based controlled study is one way to address these methodological shortcomings.

Here, we assessed mortality, psychiatric morbidity, and psychosocial integration expressed in criminal behaviour after sex reassignment in transsexual persons, in a total population cohort study with long-term follow-up information obtained from Swedish registers. The cohort was compared with randomly selected population controls matched for age and gender. We adjusted for premorbid differences regarding psychiatric morbidity and immigrant status. This study design sheds new light on transsexual persons' health after sex reassignment. It does not, however, address whether sex reassignment is an effective treatment or not.

Methods

National registers

The study population was identified by the linkage of several Swedish national registers, which contained a total of 13.8 million unique individuals. The Hospital Discharge Register (HDR, held by the National Board of Health and Welfare) contains discharge diagnoses, up to seven contributory diagnoses, external causes of morbidity or mortality, surgical procedure codes, and discharge date. Discharge diagnoses are coded according to the 8th (1969-1986), 9th (1987–1996), and 10th editions (1997-) of the International Classification of Diseases (ICD). The register covers virtually all psychiatric inpatient episodes in Sweden since 1973. Discharges that occurred up to 31 December 2003 were included. Surgical procedure codes could not be used for this study due to the lack of a specific code for sex reassignment surgery. The Total Population Register (TPR, held by Statistics Sweden) is comprised of data about the entire Swedish population. Through linkage with the Total Population Register it was possible to identify birth date and birth gender for all study subjects. The register is updated every year and gender information was available up to 2004/2005. The Medical Birth Register (MBR) was established in 1973 and contains birth data, including gender of the child at birth. National censuses based on mandatory self-report questionnaires completed by all adult citizens in 1960, 1970, 1980, and 1990 provided information on individuals, households, and dwellings, including gender, living area, and highest educational level. Complete migration data, including country of birth for immigrants for 1969–2003, were obtained from the TPR. In addition to educational information from the censuses, we also obtained highest educational level data for 1990 and 2000 from the Register of Education. The Cause of Death Register (CDR, Statistics Sweden) records all deaths in Sweden since 1952 and provided information on date of death and causes of death. Death events occurring up to 31 December 2003 are included in the study. The Crime Register (held by the National Council of Crime Prevention) provided information regarding crime type and date on all criminal convictions in Sweden during the period 1973–2004. Attempted and aggravated forms of all offences were also included. All crimes in Sweden are registered regardless of insanity at the time of perpetration; for example, for individuals who suffered from psychosis at the time of the offence. Moreover, conviction data include individuals who received custodial or non-custodial sentences and cases where the prosecutor decided to caution or fine without court proceedings. Finally, Sweden does not differ considerably from other members of the European Union regarding rates of violent crime and their resolution.[31]

Study population, identification of sex-reassigned persons (exposure assessment)

The study was designed as a population-based matched cohort study. We used the individual national registration number, assigned to all Swedish residents, including immigrants on arrival, as the primary key through all linkages. The registration number consists of 10 digits; the first six provide information of the birth date, whereas the ninth digit indicates the gender. In Sweden, a person presenting with gender dysphoria is referred to one of six specialised gender teams that evaluate and treat patients principally according to international consensus guidelines: Standards of Care.[3] With a medical certificate, the person applies to the National Board of Health and Welfare to receive permission for sex reassignment surgery and a change of legal sex status. A new national registration number signifying the new gender is assigned after sex reassignment surgery. The National

Board of Health and Welfare maintains a link between old and new national registration numbers, making it possible to follow individuals undergoing sex reassignment across registers and over time. Hence, sex reassignment surgery in Sweden requires (i) a transsexualism diagnosis and (ii) permission from the National Board of Health and Welfare.

A person was defined as exposed to sex reassignment surgery if two criteria were met: (i) at least one inpatient diagnosis of gender identity disorder diagnosis without concomitant psychiatric diagnoses in the Hospital Discharge Register, and (ii) at least one discrepancy between gender variables in the Medical Birth Register (from 1973 and onwards) or the National Censuses from 1960, 1970, 1980, or 1990 and the latest gender designation in the Total Population Register. The first criterion was employed to capture the hospitalization for sex reassignment surgery that serves to secure the diagnosis and provide a time point for sex reassignment surgery; the plastic surgeons namely record the reason for sex reassignment surgery, i.e., transsexualism, but not any co-occurring psychiatric morbidity. The second criterion was used to ensure that the person went through all steps in sex-reassignment and also changed sex legally.

The date of sex reassignment (start of follow-up) was defined as the first occurrence of a gender identity disorder diagnosis, without any other concomitant psychiatric disorder, in the Hospital Discharge Register after the patient changed sex status (any discordance in sex designation across the Censuses, Medical Birth, and Total Population registers). If this information was missing, we used instead the closest date in the Hospital Discharge Register on which the patient was diagnosed with gender identity disorder without concomitant psychiatric disorder prior to change in sex status. The reason for prioritizing the use of a gender identity disorder diagnosis *after* changed sex status over *before* was to avoid overestimating person-years at risk of sex-reassigned person.

Using these criteria, a total of 804 patients with gender identity disorder were identified, whereof 324 displayed a shift in the gender variable during the period 1973–2003. The 480 persons that did not shift gender variable comprise persons who either did not apply, or were not approved, for sex reassignment surgery. Moreover, the ICD 9 code 302 is a non specific code for sexual disorders. Hence, this group might also comprise persons that were hospitalized for sexual disorders other than transsexualism. Therefore, they were omitted from further analyses. Of the remaining 324 persons, 288 were identified with the gender identity diagnosis *after* and 36 *before* change of sex status. Out of the 288 persons identified *after* changed sex status, 185 could also be identified *before* change in sex status. The median time lag between the hospitalization *before* and *after* sex change for these 185 persons was 0.96 years (mean 2.2 years, SD 3.3).

Gender identity disorder was coded according to ICD-8: 302.3 (transsexualism) and 302.9 (sexual deviation NOS); ICD-9: 302 (overall code for sexual deviations and disorders, more specific codes were not available in ICD-9); and ICD-10: F64.0 (transsexualism), F64.1 (dual-role transvestism), F64.8 (other gender identity disorder), and F64.9 (gender identity disorder NOS). Other psychiatric disorders were coded as ICD-8: 290-301 and 303-315; ICD-9: 290-301 and 303-319; and ICD-10: F00-F63 as well as F65-F99.

Identification of population-based controls (unexposed group)

For each exposed person (N = 324), we randomly selected 10 unexposed controls. A person was defined as unexposed if there were no discrepancies in sex designation across the Censuses, Medical Birth, and Total Population registers *and* no gender identity disorder diagnosis according to the Hospital Discharge Register. Control persons were matched by sex and birth year and had to be alive and residing in Sweden at the estimated sex reassignment date of the case person. To study possible gender-specific effects on outcomes of interest, we used two different control groups: one with the same sex as the case individual at birth (birth sex matching) and the other with the sex that the case individual had been reassigned to (final sex matching).

Outcome measures

We studied mortality, psychiatric morbidity, accidents, and crime following sex reassignment. More specifically, we investigated: (1) all-cause mortality, (2) death by definite/uncertain suicide, (3) death by cardiovascular disease, and (4) death by tumour. Morbidity included (5) any psychiatric disorder (gender identity disorders excluded), (6) alcohol/drug misuse and dependence, (7) definite/uncertain suicide attempt, and (8) accidents. Finally, we addressed court convictions for (9) any criminal offence and (10) any violent offence. Each individual could contribute with several outcomes, but only one event per outcome. Causes of death (Cause of Death Registry from 1952 and onwards) were defined according to ICD as suicide (ICD-8 and ICD-9 codes E950-E959 and E980-E989, ICD-10 codes X60-X84 and Y10-Y34); cardiovascular disease (ICD-8 codes 390-458, ICD-9 codes 390-459, ICD-10 codes I00-I99); neoplasms (ICD-8 and ICD-9 codes 140-239, ICD-10 codes C00-D48), any psychiatric disorder (gender identity disorders excluded); (ICD-8 codes 290-301 and 303-315, ICD-9 codes 290-301 and 303-319, ICD-10 codes F00-F63 and F65-F99); alcohol/drug abuse and dependence (ICD-8 codes 303-304, ICD-9 codes 303-305 (tobacco use disorder excluded), ICD-10 codes F10-F16 and F18-F19 (x5 excluded); and accidents (ICD-8 and ICD-9 codes E800-E929, ICD-10 codes V01-X59).

Any criminal conviction during follow-up was counted; specifically, violent crime was defined as homicide and attempted homicide, aggravated assault and assault, robbery, threatening behaviour, harassment, arson, or any sexual offense.[32]

Covariates

Severe psychiatric morbidity was defined as inpatient care according to ICD-8 codes 291, 295-301, 303-304, and 307; ICD-9 codes 291-292, 295-298, 300-301, 303-305 (tobacco use disorder excluded), 307.1, 307.5, 308-309, and 311; ICD-10 codes F10-F16, F18-F25, F28-F45, F48, F50, and F60-F62. Immigrant status, defined as individuals born abroad, was obtained from the Total Population Register. All outcome/covariate variables were dichotomized (i.e., affected or unaffected) and without missing values.

Statistical analyses

Each individual contributed person-time from study entry (for exposed: date of sex reassignment; for unexposed: date of sex reassignment of matched case) until date of outcome event, death, emigration, or end of study period (31 December 2003), whichever came first. The association between exposure (sex reassignment) and outcome (mortality, morbidity, crime) was measured by hazard ratios (HR) with 95% CIs, taking follow-up time into account. HRs were estimated from Cox proportional hazard regression models, stratified on matched sets (1:10) to account for the matching by sex, age, and calendar time (birth year). We present crude HRs (though adjusted for sex and age through matching) and confounder-adjusted HRs [aHRs] for all outcomes. The two potential confounders, immigrant status (yes/no) and history of severe psychiatric morbidity (yes/no) prior to sex

reassignment, were chosen based on previous research[18,33] and different prevalence across cases and controls (Table 1).

Gender-separated analyses were performed and a Kaplan-Meier survival plot graphically illustrates the survival of the sex reassigned cohort and matched controls (all-cause mortality) over time. The significance level was set at 0.05 (all tests were two-sided). All outcome/covariate variables were without missing values, since they are generated from register data, which are either present (affected) or missing (unaffected). The data were analysed using SAS version 9.1 (SAS Institute Inc., Cary, NC, USA).

Ethics

The data linking of national registers required for this study was approved by the IRB at Karolinska Institutet, Stockholm. All data were analyzed anonymously; therefore, informed consent for each individual was neither necessary nor possible.

Results

We identified 324 transsexual persons (exposed cohort) who underwent sex reassignment surgery and were assigned a new legal sex between 1973 and 2003. These constituted the sex-reassigned (exposed) group. Fifty-nine percent (N = 191) of sex-reassigned persons were male-to-females and 41% (N = 133) female-to-males, yielding a sex ratio of 1.4:1 (Table 1).

The average follow-up time for all-cause mortality was 11.4 (median 9.1) years. The average follow-up time for the risk of being hospitalized for any psychiatric disorder was 10.4 (median 8.1).

Characteristics prior to sex reassignment

Table 1 displays demographic characteristics of sex-reassigned and control persons prior to study entry (sex reassignment). There were no substantial differences between female-to-males and male-to-females regarding measured baseline characteristics. Immigrant status was twice as common among transsexual individuals compared to controls, living in an urban area somewhat more common, and higher education about equally prevalent. Transsexual individuals had been hospitalized for psychiatric morbidity other than gender identity disorder prior to sex reassignment about four times more often than controls. To adjust for these baseline discrepancies, hazard ratios adjusted for immigrant status and psychiatric morbidity prior to baseline are presented for all outcomes [aHRs].

Mortality

Table 2 describes the risks for selected outcomes during follow-up among sex-reassigned persons, compared to same-age controls of the same birth sex. Sex-reassigned transsexual persons of both genders had approximately a three times higher risk of all-cause mortality than controls, also after adjustment for covariates. Table 2

Table 1. Baseline characteristics among sex-reassigned subjects in Sweden (N = 324) and population controls matched for birth year and sex.

Characteristic at baseline	Sex-reassigned subjects (N = 324)	Birth-sex matched controls (N = 3,240)	Final-sex matched controls (N = 3,240)
Gender			
Female at birth, male after sex change	133 (41%)	1,330 (41%)	1,330 (41%)
Male at birth, female after sex change	191 (59%)	1,910 (59%)	1,910 (59%)
Average age at study entry [years] (SD, min-max)			
Female at birth, male after sex change	33.3 (8.7, 20–62)	33.3 (8.7, 20–62)	33.3 (8.7, 20–62)
Male at birth, female after sex change	36.3 (10.1, 21–69)	36.3 (10.1, 21–69)	36.3 (10.1, 21–69)
Both genders	35.1 (9.7, 20–69)	35.1 (9.7, 20–69)	35.1 (9.7, 20–69)
Immigrant status			
Female at birth, male after sex change	28 (21%)	118 (9%)	100 (8%)
Male at birth, female after sex change	42 (22%)	176 (9%)	164 (9%)
Both genders	70 (22%)	294 (9%)	264 (8%)
Less than 10 years of schooling prior to entry vs. 10 years or more			
Females at birth, males after sex change	49 (44%); 62 (56%)	414 (37%); 714 (63%)	407 (36%); 713 (64%)
Males at birth, females after sex change	61 (41%); 89 (59%)	665 (40%); 1,011 (60%)	595 (35%); 1,091 (65%)
All individuals with data	110 (42%); 151 (58%)	1,079 (38%); 1,725 (62%)	1,002 (36%); 1,804 (64%)
Psychiatric morbidity* prior to study entry			
Female at birth, male after sex change	22 (17%)	47 (4%)	42 (3%)
Male at birth, female after sex change	36 (19%)	76 (4%)	72 (4%)
Both genders	58 (18%)	123 (4%)	114 (4%)
Rural [vs. urban] living area prior to entry			
Female at birth, male after sex change	13 (10%)	180 (14%)	195 (15%)
Male at birth, female after sex change	20 (10%)	319 (17%)	272 (14%)
Both genders	33 (10%)	499 (15%)	467 (14%)

Note:
*Hospitalizations for gender identity disorder were not included.
doi:10.1371/journal.pone.0016885.t001

Table 2. Risk of various outcomes among sex-reassigned subjects in Sweden (N = 324) compared to population controls matched for birth year and birth sex.

	Number of events cases/ controls 1973–2003	Outcome incidence rate per 1000 person-years 1973–2003 (95% CI)		Crude hazard ratio (95% CI) 1973–2003	Adjusted* hazard ratio (95% CI) 1973–2003	Adjusted* hazard ratio (95% CI) 1973–1988	Adjusted* hazard ratio (95% CI) 1989–2003
		Cases	Controls				
Any death	27/99	7.3 (5.0–10.6)	2.5 (2.0–3.0)	2.9 (1.9–4.5)	2.8 (1.8–4.3)	3.1 (1.9–5.0)	1.9 (0.7–5.0)
Death by suicide	10/5	2.7 (1.5–5.0)	0.1 (0.1–0.3)	19.1 (6.5–55.9)	19.1 (5.8–62.9)	N/A	N/A
Death by cardiovascular disease	9/42	2.4 (1.3–4.7)	1.1 (0.8–1.4)	2.6 (1.2–5.4)	2.5 (1.2–5.3)	N/A	N/A
Death by neoplasm	8/38	2.2 (1.1–4.3)	1.0 (0.7–1.3)	2.1 (1.0–4.6)	2.1 (1.0–4.6)	N/A	N/A
Any psychiatric hospitalisation‡	64/173	19.0 (14.8–24.2)	4.2 (3.6–4.9)	4.2 (3.1–5.6)	2.8 (2.0–3.9)	3.0 (1.9–4.6)	2.5 (1.4–4.2)
Substance misuse	22/78	5.9 (3.9–8.9)	1.8 (1.5–2.3)	3.0 (1.9–4.9)	1.7 (1.0–3.1)	N/A	N/A
Suicide attempt	29/44	7.9 (5.5–11.4)	1.0 (0.8–1.4)	7.6 (4.7–12.4)	4.9 (2.9–8.5)	7.9 (4.1–15.3)	2.0 (0.7–5.3)
Any accident	32/233	9.0 (6.3–12.7)	5.7 (5.0–6.5)	1.6 (1.1–2.3)	1.4 (1.0–2.1)	1.6 (1.0–2.5)	1.1 (0.5–2.2)
Any crime	60/350	18.5 (14.3–23.8)	9.0 (8.1–10.0)	1.9 (1.4–2.5)	1.3 (1.0–1.8)	1.6 (1.1–2.4)	0.9 (0.6–1.5)
Violent crime	14/61	3.6 (2.1–6.1)	1.4 (1.1–1.8)	2.7 (1.5–4.9)	1.5 (0.8–3.0)	N/A	N/A

Notes:
*Adjusted for psychiatric morbidity prior to baseline and immigrant status.
‡Hospitalisations for gender identity disorder were excluded.
N/A Not applicable due to sparse data.
doi:10.1371/journal.pone.0016885.t002

separately lists the outcomes depending on when sex reassignment was performed: during the period 1973-1988 or 1989–2003. Even though the overall mortality was increased across both time periods, it did not reach statistical significance for the period 1989–2003. The Kaplan-Meier curve (Figure 1) suggests that survival of transsexual persons started to diverge from that of matched controls after about 10 years of follow-up. The cause-specific mortality from suicide was much higher in sex-reassigned persons, compared to matched controls. Mortality due to cardiovascular disease was moderately increased among the sex-reassigned, whereas the numerically increased risk for malignancies was borderline statistically significant. The malignancies were lung cancer (N = 3), tongue cancer (N = 1), pharyngeal cancer (N = 1), pancreas cancer (N = 1), liver cancer (N = 1), and unknown origin (N = 1).

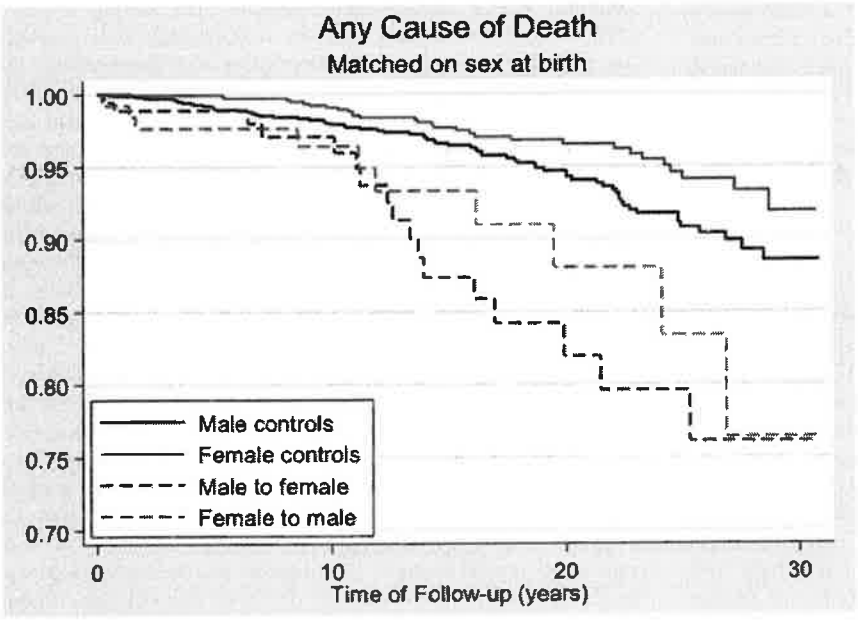

Figure 1. Death from any cause as a function of time after sex reassignment among 324 transsexual persons in Sweden (male-to-female: N = 191, female-to-male: N = 133), and population controls matched on birth year.
doi:10.1371/journal.pone.0016885.g001

Psychiatric morbidity, substance misuse, and accidents

Sex-reassigned persons had a higher risk of inpatient care for a psychiatric disorder other than gender identity disorder than controls matched on birth year and birth sex (Table 2). This held after adjustment for prior psychiatric morbidity, and was true regardless of whether sex reassignment occurred before or after 1989. In line with the increased mortality from suicide, sex-reassigned individuals were also at a higher risk for suicide attempts, though this was not statistically significant for the time period 1989–2003. The risks of being hospitalised for substance misuse or accidents were not significantly increased after adjusting for covariates (Table 2).

Crime rate

Transsexual individuals were at increased risk of being convicted for any crime or violent crime after sex reassignment (Table 2); this was, however, only significant in the group who underwent sex reassignment before 1989.

Gender differences

Comparisons of female-to-males and male-to-females, although hampered by low statistical power and associated wide confidence intervals, suggested mostly similar risks for adverse outcomes (Tables S1 and S2). However, violence against self (suicidal behaviour) and others ([violent] crime) constituted important exceptions. First, male-to-females had significantly increased risks for suicide attempts compared to both female (aHR 9.3; 95% CI 4.4–19.9) and male (aHR 10.4; 95% CI 4.9–22.1) controls. By contrast, female-to-males had significantly increased risk of suicide attempts only compared to male controls (aHR 6.8; 95% CI 2.1–21.6) but not compared to female controls (aHR 1.9; 95% CI 0.7–4.8). This suggests that male-to-females are at higher risk for suicide attempts after sex reassignment, whereas female-to-males maintain a female pattern of suicide attempts after sex reassignment (Tables S1 and S2).

Second, regarding any crime, male-to-females had a significantly increased risk for crime compared to female controls (aHR 6.6; 95% CI 4.1–10.8) but not compared to males (aHR 0.8; 95% CI 0.5–1.2). This indicates that they retained a male pattern regarding criminality. The same was true regarding violent crime. By contrast, female-to-males had higher crime rates than female controls (aHR 4.1; 95% CI 2.5–6.9) but did not differ from male controls. This indicates a shift to a male pattern regarding criminality and that sex reassignment is coupled to increased crime rate in female-to-males. The same was true regarding violent crime.

Discussion

Principal findings and comparison with previous research

We report on the first nationwide population-based, long-term follow-up of sex-reassigned transsexual persons. We compared our cohort with randomly selected population controls matched for age and gender. The most striking result was the high mortality rate in both male-to-females and female-to males, compared to the general population. This contrasts with previous reports (with one exception[8]) that did not find an increased mortality rate after sex reassignment, or only noted an increased risk in certain subgroups.[7,9,10,11] Previous clinical studies might have been biased since people who regard their sex reassignment as a failure are more likely to be lost to follow-up. Likewise, it is cumbersome to track deceased persons in clinical follow-up studies. Hence, population-based register studies like the present are needed to improve representativity.[19,34]

The poorer outcome in the present study might also be explained by longer follow-up period (median >10 years) compared to previous studies. In support of this notion, the survival curve (Figure 1) suggests increased mortality from ten years after sex reassignment and onwards. In accordance, the overall mortality rate was only significantly increased for the group operated before 1989. However, the latter might also be explained by improved health care for transsexual persons during 1990s, along with altered societal attitudes towards persons with different gender expressions.[35]

Mortality due to cardiovascular disease was significantly increased among sex reassigned individuals, albeit these results should be interpreted with caution due to the low number of events. This contrasts, however, a Dutch follow-up study that reported no increased risk for cardiovascular events.[10,11] A recent meta-analysis concluded, however, that data on cardiovascular outcome after cross-sex steroid use are sparse, inconclusive, and of very low quality.[34]

With respect to neoplasms, prolonged hormonal treatment might increase the risk for malignancies,[36] but no previous study has tested this possibility. Our data suggested that the cause-specific risk of death from neoplasms was increased about twice (borderline statistical significance). These malignancies (see Results), however, are unlikely to be related to cross-hormonal treatment.

There might be other explanations to increased cardiovascular death and malignancies. Smoking was in one study reported in almost 50% by the male-to females and almost 20% by female-to-males.[9] It is also possible that transsexual persons avoid the health care system due to a presumed risk of being discriminated.

Mortality from suicide was strikingly high among sex-reassigned persons, also after adjustment for prior psychiatric morbidity. In line with this, sex-reassigned persons were at increased risk for suicide attempts. Previous reports [6,8,10,11] suggest that transsexualism is a strong risk factor for suicide, also after sex reassignment, and our long-term findings support the need for continued psychiatric follow-up for persons at risk to prevent this.

Inpatient care for psychiatric disorders was significantly more common among sex-reassigned persons than among matched controls, both before and after sex reassignment. It is generally accepted that transsexuals have more psychiatric ill-health than the general population prior to the sex reassignment.[18,21,22,33] It should therefore come as no surprise that studies have found high rates of depression,[9] and low quality of life[16,25] also after sex reassignment. Notably, however, in this study the increased risk for psychiatric hospitalisation persisted even after adjusting for psychiatric hospitalisation prior to sex reassignment. This suggests that even though sex reassignment alleviates gender dysphoria, there is a need to identify and treat co-occurring psychiatric morbidity in transsexual persons not only before but also after sex reassignment.

Criminal activity, particularly violent crime, is much more common among men than women in the general population. A previous study of all applications for sex reassignment in Sweden up to 1992 found that 9.7% of male-to-female and 6.1% of female-to-male applicants had been prosecuted for a crime.[33] Crime after sex reassignment, however, has not previously been studied. In this study, male-to-female individuals had a higher risk for criminal convictions compared to female controls but not compared to male controls. This suggests that the sex reassignment procedure neither increased nor decreased the risk for criminal offending in male-to-females. By contrast, female-to-males were at a higher risk for criminal convictions compared to female controls and did not differ from male controls, which suggests increased crime proneness in female-to-males after sex reassignment.

Strengths and limitations of the study

Strengths of this study include nationwide representativity over more than 30 years, extensive follow-up time, and minimal loss to follow-up. Many previous studies suffer from low outcome ascertainment,[6,9,21,29] whereas this study has captured almost the entire population of sex-reassigned transsexual individuals in Sweden from 1973–2003. Moreover, previous outcome studies have mixed pre-operative and post-operative transsexual persons,[22,37] while we included only post-operative transsexual persons that also legally changed sex. Finally, whereas previous studies either lack a control group or use standardised mortality rates or standardised incidence rates as comparisons,[9,10,11] we selected random population controls matched by birth year, and either birth or final sex.

Given the nature of sex reassignment, a double blind randomized controlled study of the result after sex reassignment is not feasible. We therefore have to rely on other study designs. For the purpose of evaluating whether sex reassignment is an effective treatment for gender dysphoria, it is reasonable to compare reported gender dysphoria pre and post treatment. Such studies have been conducted either prospectively[7,12] or retrospectively,[5,6,9,22,25,26,29,38] and suggest that sex reassignment of transsexual persons improves quality of life and gender dysphoria. The limitation is of course that the treatment has not been assigned randomly and has not been carried out blindly.

For the purpose of evaluating the safety of sex reassignment in terms of morbidity and mortality, however, it is reasonable to compare sex reassigned persons with matched population controls. The caveat with this design is that transsexual persons before sex reassignment might differ from healthy controls (although this bias can be statistically corrected for by adjusting for baseline differences). It is therefore important to note that the current study is only informative with respect to transsexuals persons health after sex reassignment; no inferences can be drawn as to the effectiveness of sex reassignment as a treatment for transsexualism. In other words, the results should not be interpreted such as sex reassignment *per se* increases morbidity and mortality. Things might have been even worse without sex reassignment. As an analogy, similar studies have found increased somatic morbidity, suicide rate, and overall mortality for patients treated for bipolar disorder and schizophrenia.[39,40] This is important information, but it does not follow that mood stabilizing treatment or antipsychotic treatment is the culprit.

Other facets to consider are first that this study reflects the outcome of psychiatric and somatic treatment for transsexualism provided in Sweden during the 1970s and 1980s. Since then, treatment has evolved with improved sex reassignment surgery, refined hormonal treatment,[11,41] and more attention to psychosocial care that might have improved the outcome. Second, transsexualism is a rare condition and Sweden is a small country (9.2 million inhabitants in 2008). Hence, despite being based on a comparatively large national cohort and long-term follow-up, the statistical power was limited. Third, regarding psychiatric morbidity after sex reassignment, we assessed inpatient psychiatric care. Since most psychiatric care is provided in outpatient settings (for which no reliable data were available), underestimation of the *absolute* prevalences was inevitable. However, there is no reason to believe that this would change the *relative risks* for psychiatric morbidity unless sex-reassigned transsexual individuals were more likely than matched controls to be admitted to hospital for any given psychiatric condition.

Finally, to estimate start of follow-up, we prioritized using the date of a gender identity disorder diagnosis *after* changed sex status over *before* changed sex status, in order to avoid overestimating person-years at risk after sex-reassignment. This means that adverse outcomes might have been underestimated. However, given that the median time lag between the hospitalization before and after change of sex status was less than a year (see Methods), this maneuver is unlikely to have influenced the results significantly. Moreover, all deaths will be recorded regardless of this exercise and mortality hence correctly estimated.

Conclusion

This study found substantially higher rates of overall mortality, death from cardiovascular disease and suicide, suicide attempts, and psychiatric hospitalisations in sex-reassigned transsexual individuals compared to a healthy control population. This highlights that post surgical transsexuals are a risk group that need long-term psychiatric and somatic follow-up. Even though surgery and hormonal therapy alleviates gender dysphoria, it is apparently not sufficient to remedy the high rates of morbidity and mortality found among transsexual persons. Improved care for the transsexual group after the sex reassignment should therefore be considered.

Supporting Information

Table S1 Risk of various outcomes in sex-reassigned persons in Sweden compared to population controls matched for birth year and *birth sex*.
(DOCX)

Table S2 Risk of various outcomes in sex-reassigned persons in Sweden compared to controls matched for birth year and *final sex*.
(DOCX)

Author Contributions

Conceived and designed the experiments: CD PL AJ NL ML. Performed the experiments: MB AJ. Analyzed the data: CD PL MB AJ NL ML. Contributed reagents/materials/analysis tools: PL NL AJ. Wrote the paper: CD PL MB AJ NL ML.

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Association Between Gender-Affirming Surgeries and Mental Health Outcomes

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CME Quiz at jamacmelookup.com

IMPORTANCE Requests for gender-affirming surgeries are rapidly increasing among transgender and gender diverse (TGD) people. However, there is limited evidence regarding the mental health benefits of these surgeries.

OBJECTIVE To evaluate associations between gender-affirming surgeries and mental health outcomes, including psychological distress, substance use, and suicide risk.

DESIGN, SETTING, AND PARTICIPANTS In this study, we performed a secondary analysis of data from the 2015 US Transgender Survey, the largest existing data set containing comprehensive information on the surgical and mental health experiences of TGD people. The survey was conducted across 50 states, Washington, DC, US territories, and US military bases abroad. A total of 27 715 TGD adults took the US Transgender Survey, which was disseminated by community-based outreach from August 19, 2015, to September 21, 2015. Data were analyzed between November 1, 2020, and January 3, 2021.

EXPOSURES The exposure group included respondents who endorsed undergoing 1 or more types of gender-affirming surgery at least 2 years prior to submitting survey responses. The comparison group included respondents who endorsed a desire for 1 or more types of gender-affirming surgery but denied undergoing any gender-affirming surgeries.

MAIN OUTCOMES AND MEASURES Endorsement of past-month severe psychological distress (score of ≥13 on Kessler Psychological Distress Scale), past-month binge alcohol use, past-year tobacco smoking, and past-year suicidal ideation or suicide attempt.

RESULTS Of the 27 715 respondents, 3559 (12.8%) endorsed undergoing 1 or more types of gender-affirming surgery at least 2 years prior to submitting survey responses, while 16 401 (59.2%) endorsed a desire to undergo 1 or more types of gender-affirming surgery but denied undergoing any of these. Of the respondents in this study sample, 16 182 (81.1%) were between the ages of 18 and 44 years, 16 386 (82.1%) identified as White, 7751 (38.8%) identified as transgender women, 6489 (32.5%) identified as transgender men, and 5300 (26.6%) identified as nonbinary. After adjustment for sociodemographic factors and exposure to other types of gender-affirming care, undergoing 1 or more types of gender-affirming surgery was associated with lower past-month psychological distress (adjusted odds ratio [aOR], 0.58; 95% CI, 0.50-0.67; $P < .001$), past-year smoking (aOR, 0.65; 95% CI, 0.57-0.75; $P < .001$), and past-year suicidal ideation (aOR, 0.56; 95% CI, 0.50-0.64; $P < .001$).

CONCLUSIONS AND RELEVANCE This study demonstrates an association between gender-affirming surgery and improved mental health outcomes. These results contribute new evidence to support the provision of gender-affirming surgical care for TGD people.

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Transgender and gender diverse (TGD) people experience a disproportionate burden of mental health problems compared with the general population.[1,2] Prior studies of mental health among TGD people have demonstrated a 41% lifetime prevalence of suicide attempts,[2] 7% to 61% lifetime prevalence of binge drinking,[3] and a 33% prevalence of tobacco use.[4] Increased adverse mental health outcomes among TGD people are likely attributable to stigma, discrimination, pathologization, economic marginalization, violence, and dysphoria associated with an incongruence between gender identity and societal expectations based on one's sex assigned at birth.[5]

According to *Standards of Care* published by the World Professional Association for Transgender Health, gender-affirming surgery is a medically necessary treatment to alleviate psychological distress for many TGD people.[6] The term *gender-affirming surgery* refers to any surgical procedures offered to affirm the gender identities of TGD people. The process of surgical gender affirmation is individually tailored because not all TGD people desire or access these procedures.[7] In the largest survey of the TGD community to our knowledge to date, 25% of respondents reported undergoing some type of gender-affirming surgery.[8]

As a result of professional recommendations, insurance nondiscrimination laws, and expansion of dedicated transgender health practices, demand for gender-affirming surgery is steadily rising.[9] In the United States, incidence of gender-affirming surgeries has increased annually since 2000.[10] Despite growing demand for and access to gender-affirming surgery, there is a paucity of high-quality evidence regarding its effects on mental health outcomes among TGD people.

Existing evidence on the association between gender-affirming surgeries and mental health outcomes is largely derived from small-sample, cross-sectional, and uncontrolled studies.[1,11,12] A seminal 1998 review of the experiences of more than 2000 TGD people from 79 predominantly uncontrolled follow-up studies demonstrated qualitative improvement in psychosocial outcomes following gender-affirming surgery.[11] Attempts since then to empirically demonstrate mental health benefits from gender-affirming surgery have generated mixed results. A meta-analysis of 1833 TGD people across 28 studies concluded that studies offered "low-quality evidence" for positive mental health benefits from surgical gender affirmation.[12] The largest existing study on this subject to our knowledge,[13] a total population study including 2679 people diagnosed as having gender incongruence in Sweden, demonstrated a longitudinal association between gender-affirming surgery and reduced mental health treatment utilization.[13] However, a 2020 published correction of this study[14] demonstrated no mental health benefit from gender-affirming surgery after comparison with a control group of TGD people who had not yet undergone surgery. Mental health effects of gender-affirming surgery thus remain controversial.

Given the increasing incidence of surgical gender affirmation among TGD people, there is a significant need for clarification of the mental health benefits of gender-affirming surgery. In this article, we present the largest study to our knowledge to date on the association between gender-affirming surgeries and mental health outcomes. Using the 2015 US Transgender Survey, the largest existing data set on surgical and mental health experiences of TGD people, we investigate the hypothesis that gender-affirming surgeries are associated with improved mental health outcomes, including psychological distress, substance use, and suicidality.

Key Points

Question Are gender-affirming surgeries associated with better mental health outcomes among transgender and gender diverse (TGD) people?

Findings In this secondary analysis of the 2015 US Transgender Survey (n = 27 715), TGD people with a history of gender-affirming surgery had significantly lower odds of past-month psychological distress, past-year tobacco smoking, and past-year suicidal ideation compared with TGD people with no history of gender-affirming surgery.

Meaning These findings support the provision of gender-affirming surgeries for TGD people who seek them.

Methods

Study Design

In this study, we performed a secondary analysis of the 2015 US Transgender Survey (USTS).[8] This investigation is reported using Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines.

Study Population and Data Source

The 2015 USTS was a cross-sectional, nonprobability sample of responses from 27 715 TGD adults from 50 US states, Washington, DC, US territories, and US military bases abroad. The survey was developed by researchers, advocates, people with lived experience, and subject experts over the course of a year. The final survey contained 324 possible questions with 32 domains addressing subjects including health and health care access. It was disseminated by community-based outreach and administered online from August 19, 2015, to September 21, 2015. The USTS protocol was approved by the University of California, Los Angeles institutional review board.[8] The protocol for the present study was reviewed by the Fenway Institute institutional review board and did not meet criteria for human subjects research. For this reason, consent was not obtained.

Outcomes

Five binary mental health outcomes were examined, including endorsement or denial of the following: (1) past-month severe psychological distress (score on the Kessler Psychological Distress Scale meeting the previously validated threshold of ≥13),[15] (2) past-month binge alcohol use (≥5 alcoholic drinks on one occasion), (3) past-year tobacco smoking, (4) past-year suicidal ideation, and (5) past-year suicide attempt.

Exposure Group

The exposure group included respondents who endorsed a history of gender-affirming surgery, defined as undergoing 1 or

more types of gender-affirming surgery at least 2 years prior to submitting responses to the USTS. Respondents were asked about their experiences with gender-affirming surgeries through the question, "Have you had or do you want any of the health care listed below for gender transition?" Respondents were presented with 1 of 2 lists of gender-affirming surgeries based on their self-reported sex assigned at birth. For each surgery, respondents were able to indicate one of the following answers: "Have had it," "Want it some day," "Not sure if I want this," or "Do not want this." Respondents were included in the exposure group if they answered "Have had it" to 1 or more of the following types of gender-affirming procedures: breast augmentation, orchiectomy, vaginoplasty/labiaplasty, trachea shave, facial feminization surgery, or voice surgery. Respondents were also included in the exposure group if they answered "Have had it" to one or more of the following types of gender-affirming procedures: chest surgery, hysterectomy, clitoral release/metoidioplasty/centurion procedure, or phalloplasty.

In this study, outcomes of interest included mental health symptoms in the year prior to taking the USTS. To ensure that exposure to gender-affirming surgeries temporally preceded all outcomes of interest, respondents were included in the exposure group if they had received their first gender-affirming surgery at least 2 years prior to submitting responses to the USTS. For each respondent with a history of gender-affirming surgery, the number of years since their first surgery was calculated by subtracting age at first surgery from current age.

Control Group

The control group included respondents who desired gender-affirming surgeries but had not yet received any. Respondents were included in this group if they answered "Want it some day" for at least 1 of the aforementioned gender-affirming procedures but did not answer "Have had it" for any of them. We excluded participants who did not report desire for any gender-affirming surgeries.

Covariates

The following sociodemographic covariates were examined: age (18-44 years, 45-64 years, and ≥65 years), education level (less than high school or high school graduate up to associate degree, bachelor degree, or higher), employment status (employed, unemployed, or out of labor force), gender identity (transgender woman, transgender man, nonbinary, or cross-dresser), health insurance status (uninsured or insured), household income (<$25 000, $25 000-$99 999, or ≥$100 000), race (Alaska Native/American Indian, Asian/Pacific Islander, Black/African American, Latinx/Hispanic, other/biracial/multiracial, or White), sex assigned at birth (female or male), and sexual orientation (asexual, lesbian/gay/bisexual, or heterosexual).

Family rejection was included as a covariate and was defined by the USTS as history of any of the following experiences with a family member owing to the respondent's gender identity: ending the relationship, physical violence, being forced out of their home, being prevented from wearing desired gender-concordant clothing, and exposure to gender identity conversion efforts. Lifetime exposures to other types of gender-affirming care were also examined, including gender-affirming counseling, pubertal suppression, and hormone therapy. Given the possibility that any of these covariates could confound the relationship between gender-affirming surgeries and mental health outcomes, all covariates were included in the final multivariable models.

Statistical Analysis

All analyses were conducted using Stata, version 16.1 (StataCorp). Unweighted descriptive statistics for exposure and control groups were calculated and are presented as frequencies and percentages.

Multivariable logistic regression models adjusted for all covariates were generated to examine whether undergoing gender-affirming surgery is associated with each of the examined mental health outcomes.[16,17] To account for the survey's nonprobability sampling, all models incorporated survey weights to correct sampling biases related to age and race/ethnicity. Adjusted odds ratios (aORs), 95% CIs, and 2-sided *P* values are reported.

We performed a post hoc analysis to determine whether associations between gender-affirming surgeries and mental health outcomes differ based on the degree of surgical affirmation. The exposure variable was recoded as 3 categories: those who received all desired surgeries, some desired surgeries, and no desired surgeries. Because the USTS did not collect information on timing of each respondent's last surgery, respondents for this post hoc analysis could not be excluded to ensure that all exposures temporally preceded mental health outcomes. The recoded 3-category exposure variable was substituted into 5 additional multivariable logistic regression models, adjusted for all aforementioned covariates.

Owing to concerns that baseline mental health status may confound associations between gender-affirming surgery and mental health outcomes, we conducted an additional post hoc analysis to determine whether lifetime mental health measures were associated with exposure to gender-affirming surgeries. We did not incorporate these measures into the primary models due to collinearity. Four separate post hoc models, adjusted for all aforementioned covariates, regressed exposure to gender-affirming surgeries against lifetime suicidal ideation, lifetime suicide attempts, lifetime alcohol use, and lifetime smoking.

To account for multiple hypothesis testing, a Bonferroni correction was applied to adjust for 19 total tests. A *P* value of less than .002 was used as the corrected threshold for statistical significance.

Less than 2% of the study sample had missing data for exposure and outcome variables, and less than 9% of the study sample had missing data for any covariates. Given that these are acceptably low levels of missingness,[18] respondents with missing data were excluded without compensatory methods.

Results

Of the 27 715 respondents, 3559 (12.8%) endorsed undergoing 1 or more types of gender-affirming surgery at least 2 years

Table 1. Sample Sociodemographics[a]

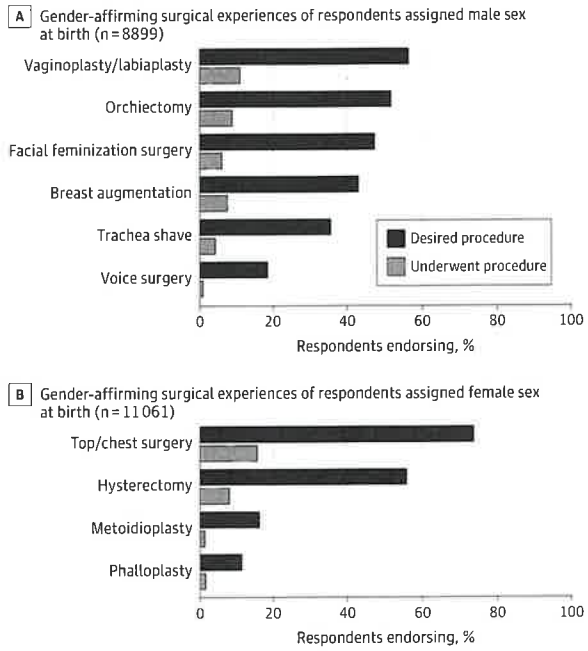
Characteristic	No. (%)		Difference, % (95% CI)
	No history of surgery (n = 16 401)	History of surgery (n = 3559)	
Age, y			
18-44	14 170 (86.4)	2012 (56.5)	29.9 (28.2 to 31.6)
45-64	1922 (11.7)	1261 (35.4)	−23.7 (−25.4 to −22.1)
≥65	309 (1.9)	285 (8.0)	−6.1 (−7.0 to −5.2)
Education			
Less than high school	682 (4.2)	37 (1.0)	3.1 (2.7 to 3.6)
High school graduate up to associate degree	10 918 (66.6)	1243 (34.9)	31.6 (29.9 to 33.3)
Bachelor degree or higher	4801 (29.3)	2279 (64.0)	−34.8 (−36.5 to −33.0)
Employment			
Employed	10 306 (62.8)	2585 (72.6)	−9.8 (−11.4 to −8.2)
Unemployed	2474 (15.1)	202 (5.7)	9.4 (8.5 to 10.3)
Out of labor force	3537 (21.6)	755 (21.2)	0.4 (−1.1 to 1.8)
Family rejection			
Yes	7466 (45.5)	2328 (65.4)	−19.9 (−21.6 to −18.2)
No	7360 (44.9)	1173 (33.0)	11.9 (10.2 to 13.6)
Gender identity			
Transgender woman	6277 (38.3)	1474 (41.4)	−3.1 (−4.9 to −1.4)
Transgender man	4764 (29.1)	1725 (48.5)	−19.4 (−21.2 to −17.6)
Nonbinary	4958 (30.2)	342 (9.6)	20.6 (19.4 to 21.8)
Cross-dresser	402 (2.5)	18 (0.5)	2.0 (1.6 to 2.3)
Health insurance			
Uninsured	2397 (14.6)	304 (8.5)	6.1 (5.0 to 7.1)
Insured	13 959 (85.1)	3253 (91.4)	−6.3 (−7.4 to −5.2)
Household income			
<$25 000	5960 (36.3)	768 (21.6)	14.7 (13.2 to 16.3)
$25 000-$99 999	6829 (41.6)	1804 (50.7)	−9.1 (−10.9 to −7.2)
≥$100 000	2073 (12.6)	840 (23.6)	−11.0 (−12.4 to −9.5)
Race/ethnicity			
Alaska Native/American Indian	206 (1.3)	39 (1.1)	0.2 (−0.2 to 0.5)
Asian/Pacific Islander	436 (2.7)	64 (1.8)	0.9 (0.4 to 1.4)
Black/African American	459 (2.8)	124 (3.5)	−0.7 (−1.3 to −0.03)
Latinx/Hispanic	929 (5.7)	154 (4.3)	1.3 (0.6 to 2.1)
Other/biracial/multiracial	963 (5.9)	200 (5.6)	0.3 (−0.6 to 1.1)
White	13 408 (81.8)	2978 (83.7)	−1.9 (−3.3 to −0.6)
Sex assigned at birth			
Female	9032 (55.1)	2029 (57.0)	−1.9 (−3.7 to −0.1)
Male	7369 (44.9)	1530 (43.0)	1.9 (0.1 to 3.7)
Sexual orientation			
Asexual	2002 (12.2)	228 (6.4)	5.8 (4.9 to 6.7)
Lesbian, gay, bisexual	11 433 (69.7)	2393 (67.2)	2.5 (0.8 to 4.2)
Heterosexual	1729 (10.5)	782 (22.0)	−11.4 (−12.9 to −10.0)
Other gender-affirming care			
Counseling	9016 (55.0)	3099 (87.1)	−32.1 (−33.4 to −30.8)
Pubertal suppression	197 (1.2)	94 (2.6)	−1.4 (−2.0 to −0.9)
Hormone therapy	7104 (43.3)	3213 (90.3)	−47.0 (−48.2 to −45.7)

[a] Column percentages may not add up to 100% because missing data are not displayed.

prior to submitting survey responses, while 16 401 respondents (59.2%) endorsed a desire to undergo 1 or more types of gender-affirming surgery but denied undergoing any of these.

Compared with the control group, the exposure group had higher percentages of respondents who were older, employed, more educated, endorsed family rejection, reported having health insurance, and reported higher household income. Respondents in the exposure group were more likely to endorse a history of gender-affirming counseling, pubertal suppression, and hormone therapy (Table 1).

Figure 1. Desire for and History of Gender-Affirming Surgical Procedures in Study Sample



Includes 2015 US Transgender Survey respondents who indicated they desired and either had or had not undergone at least 1 type of gender-affirming surgery. Respondents were presented with 1 of 2 lists of gender-affirming surgeries based on their self-reported sex assigned at birth.

Figure 2. Comparison of Mental Health Outcomes Among Respondents Who Did and Did Not Undergo Gender-Affirming Surgery

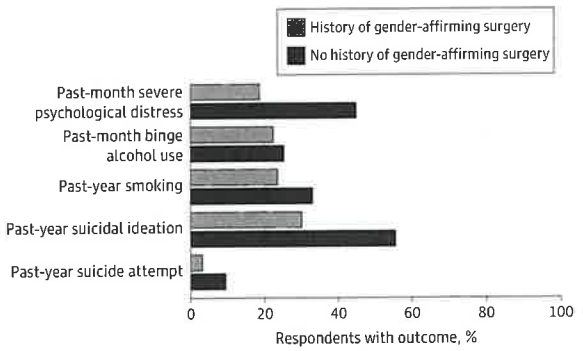


Table 2. Association Between History of Gender-Affirming Surgery and Mental Health Outcomes[a]

Variable	aOR (95% CI)[b]	*P* value
Severe psychological distress (past month)[c]	0.58 (0.50-0.67)	<.001
Substance use		
Binge alcohol use (past month)[d]	0.83 (0.72-0.96)	.01
Smoking (past year)	0.65 (0.57-0.75)	<.001
Suicidality (past year)		
Ideation	0.56 (0.50-0.64)	<.001
Attempt	0.65 (0.47-0.90)	.009

Abbreviation: aOR, adjusted odds ratio.

[a] Adjusted for age, education, employment status, family rejection, gender identity, health insurance, household income, race/ethnicity, sex assigned at birth, sexual orientation, history of gender-affirming counseling, pubertal suppression, and history of gender-affirming hormone therapy.

[b] Reference/control group (n = 16 401) is composed of individuals who desired at least 1 type of gender-affirming surgery but had not received any surgeries. Exposure group (n = 3559) is limited to respondents who had their first surgery at least 2 years prior to submitting survey responses.

[c] Defined as a score of at least 13 on the Kessler Psychological Distress Scale.

[d] Defined as consuming at least 5 alcoholic drinks on the same occasion.

For each surgical procedure, the percentage of people who desired it was higher than the percentage of people who endorsed undergoing it (**Figure 1**). For every adverse mental health outcome, the percentage of respondents who endorsed it was lower in the exposure group than in the control group (**Figure 2**).

After adjustment for sociodemographic factors and exposure to other types of gender-affirming care, undergoing 1 or more types of gender-affirming surgery was associated with lower past-month psychological distress (aOR, 0.58; 95% CI, 0.50-0.67; $P < .001$), past-year smoking (aOR, 0.65; 95% CI, 0.57-0.75; $P < .001$), and past-year suicidal ideation (aOR, 0.56; 95% CI, 0.50-0.64; $P < .001$). After Bonferroni correction, there was no statistically significant association between gender-affirming surgeries and past-month binge alcohol use or past-year suicide attempts (**Table 2**).

In the post hoc analysis stratifying by degree of surgical affirmation, 16 401 respondents were in the reference group who received no desired surgeries. Respondents who had undergone all desired surgeries (n = 2448) had significant reductions in the odds of each adverse mental health outcome, and these reductions were more profound than those among respondents who had received only some desired surgeries (n = 3311) (**Table 3**).

Measures of lifetime mental health were not associated with exposure to gender-affirming surgeries. After adjustment for all aforementioned covariates, undergoing gender-affirming surgery was not associated with lifetime suicidal ideation (aOR, 1.00; 95% CI, 0.85-1.20; $P = .92$), lifetime suicide attempts (aOR, 1.16; 95% CI, 1.01-1.34; $P = .04$), lifetime alcohol use (aOR, 1.00; 95% CI, 0.99-1.01; $P = .96$), or lifetime smoking (aOR, 1.00; 95% CI, 1.00-1.01; $P = .34$).

Discussion

To our knowledge, this is the first large-scale, controlled study to demonstrate an association between gender-affirming surgery and improved mental health outcomes. In this study, we demonstrate that undergoing gender-affirming surgery is associated with decreased odds of past-month severe psychological distress, past-year smoking, and past-year suicidal ideation. The post hoc analysis stratifying by degree of surgical affirmation demonstrates that TGD people who underwent all desired surgeries had significantly lower odds of all adverse mental health outcomes, and these benefits were stronger than

Table 3. Association Between Degree of Surgical Gender Affirmation and Mental Health Outcomes[a]

Variable	Received some desired surgeries (n = 3311)[b]		Received all desired surgeries (n = 2448)[b]	
	aOR (95% CI)	*P* value	aOR (95% CI)	*P* value
Severe psychological distress (past month)[c]	0.70 (0.60-0.81)	<.001	0.47 (0.39-0.56)	<.001
Substance use				
Binge alcohol use (past month)[d]	0.97 (0.84-1.11)	.63	0.75 (0.64-0.87)	<.001
Smoking (past year)	0.75 (0.66-0.86)	<.001	0.58 (0.49-0.68)	<.001
Suicidality (past year)				
Ideation	0.72 (0.63-0.81)	<.001	0.44 (0.38-0.51)	<.001
Attempt	0.70 (0.53-0.93)	.01	0.44 (0.28-0.70)	<.001

Abbreviation: aOR, adjusted odds ratio.

[a] Adjusted for age, education, employment status, family rejection, gender identity, health insurance, household income, race/ethnicity, sex assigned at birth, sexual orientation, history of gender-affirming counseling, pubertal suppression, and history of gender-affirming hormone therapy.

[b] Reference group is individuals who received none of their desired surgeries (n = 16 401).

[c] Defined as a score of at least 13 on the Kessler Psychological Distress Scale.

[d] Defined as consuming at least 5 alcoholic drinks on the same occasion.

among TGD people who only received some desired surgeries.

The observed associations between gender-affirming surgery, psychological distress, and suicide risk reinforce previous small-sample studies suggesting that gender-affirming surgery improves mental health and quality of life among TGD people.[1,12] Our findings also reflect evidence from qualitative studies indicating perceived mental health benefits of gender-affirming surgeries among TGD people.[19-21] In our primary analysis, although gender-affirming surgery was associated with lower odds of past-year suicidal ideation, there was no statistically significant association between gender-affirming surgeries and past-year suicide attempts. However, in a post hoc analysis respondents who underwent all desired gender-affirming surgeries had significantly lower odds of past-year suicide attempts.

The association observed between gender-affirming surgeries and reduction in substance use behaviors is consistent with previous studies involving small community samples that demonstrated associations between gender-affirming medical care and lower odds of high-risk substance use.[22,23] In the primary analysis, undergoing gender-affirming surgery was not significantly associated with past-month binge alcohol use. This may be consistent with evidence that after adjustment for sociodemographic factors, gender minority identity itself does not predict high-risk alcohol use.[24] However, in a post hoc analysis, respondents who underwent all desired gender-affirming surgeries had significantly lower odds of past-month binge alcohol use.

This investigation offers evidence to support the clinical practice of gender-affirming surgery. Guidelines for provision of gender-affirming medical and surgical care have historically been challenged based on a limited evidence base. The American Psychiatric Association has previously concluded that the quality of evidence for treatment of gender dysphoria is low, and consequently, recommendations regarding gender-affirming care have been driven by clinical consensus where empirical evidence is lacking.[25] This study offers new data that substantiate the current clinical consensus by expanding the evidence base in support of gender-affirming surgical care.

The observed mental health benefits of gender-affirming surgeries in this study highlight the importance of policies that facilitate access to surgical gender affirmation. In the present study, the percentages of people who had undergone each gender-affirming surgical procedure were substantially lower than the percentages of people who desired them, suggesting significant barriers to accessing gender-affirming surgeries. State-level prohibitions against insurance exclusions for gender-affirming care have been associated with more extensive coverage of gender-affirming surgical procedures.[26] In light of this study's results, such policies may be of even greater public health interest. US federal policies related to gender-affirming care have included a recent reversal of Affordable Care Act insurance protections for gender affirmation and the continued prohibition of Veterans Affairs funding allocation for gender-affirming surgeries.[27,28] Formulation of evidence-based policies for the financing of gender-affirming surgery will be crucial for advancing the health and well-being of TGD communities.

Strengths and Limitations

This study's strengths include aspects of its design that address prior limitations in the existing literature on this subject. Multiple meta-analyses of studies examining the association between gender-affirming surgeries and mental health outcomes have demonstrated that much of the existing literature consists of evidence derived with small sample sizes, lack of control groups, and lack of adjustment for other kinds of gender-affirming care.[12,29] Our study is responsive to these methodologic concerns.

First, we used the largest existing data set containing information on the surgical and mental health experiences of TGD people. Second, this is, to our knowledge, the first large-scale study on this subject to use the ideal control group to examine associations between gender-affirming surgeries and mental health outcomes: individuals who desire gender-affirming surgery but have not yet received it. Experts have cautioned against using comparison groups that conflate TGD people who did not undergo gender-affirming surgery because they were waiting for it with TGD people not seeking it in the first place. Inability to differentiate these 2 groups likely

contributed to the lack of significant mental health benefit observed in the 2019 large-scale study on this subject.[13,30]

Third, although this survey-based investigation uses a cross-sectional study design, we constructed an exposure group that includes only individuals exposed to their first gender-affirming surgery prior to the window of assessment for any adverse mental health outcomes. Thus, we ensured that our exposure temporally preceded our outcomes, allowing us to better understand the direction of observed associations. These exclusions could not be performed in our post hoc analysis stratifying by degree of surgical affirmation, and that analysis should therefore be interpreted with caution.

Fourth, our data set allowed us to control for previous experiences of gender-affirming counseling, pubertal suppression, and hormone therapy. Consequently, this study is, to our knowledge, the first large-scale investigation to ascertain the mental health benefits of gender-affirming surgeries independent of other common forms of gender-affirming health care.

Our study has several limitations. The nonprobability sampling of the USTS may limit generalizability. All measures are self-reported and may be subject to response bias. Furthermore, the USTS only offers data on experiences with 10 specific types of gender-affirming surgeries and does not capture the full range of procedures that constitute gender-affirming surgery. Lastly, because this is an observational study, it may be subject to unmeasured confounding. Much of the literature on mental health benefits of gender-affirming surgery has been complicated by inability to adjust for a key confounder: baseline mental health status. Our post hoc analysis demonstrates that lifetime suicidality and substance use behaviors are not associated with the exposure variable in this sample. Therefore, prior mental health factors do not appear to confound associations between gender-affirming surgery and subsequent mental health outcomes in our study. There may nevertheless be other types of mental health problems not captured in the USTS that confound these associations. These limitations highlight the need for larger probability-based surveys with TGD communities, more consistent gender identity data collection across health care systems, and more comprehensive baseline health data collection with TGD populations.

Conclusions

In this article, we present the largest study to our knowledge to date on associations between gender-affirming surgeries and mental health outcomes. Our results demonstrate that undergoing gender-affirming surgery is associated with improved past-month severe psychological distress, past-year smoking, and past-year suicidal ideation. Our findings offer empirical evidence to support provision of gender-affirming surgical care for TGD people who seek it. Furthermore, this study provides evidence to support policies that expand and protect access to gender-affirming surgical care for TGD communities.

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Author Contributions: Mr Almazan had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.
Concept and design: All authors.
Acquisition, analysis, or interpretation of data: All authors.
Drafting of the manuscript: All authors.
Critical revision of the manuscript for important intellectual content: All authors.
Statistical analysis: Almazan.
Obtained funding: Keuroghlian.
Administrative, technical, or material support: Keuroghlian.
Supervision: Keuroghlian.

Conflict of Interest Disclosures: Dr Keuroghlian reported grants from Patient-Centered Outcomes Research Institute Contract AD-2017C1-6569 (PI: Sari L. Reisner) during the conduct of the study; in addition, Dr Keuroghlian stands to receive future royalties as editor of a forthcoming McGraw-Hill Education textbook on transgender and gender diverse care. No other disclosures were reported.

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Invited Commentary

Gender-Affirming Surgeries and Improved Psychosocial Health Outcomes

Andrew A. Marano, MD; Matthew R. Louis, MD; Devin Coon, MD, MSE

There is a growing body of literature supporting the positive outcomes of gender-affirming surgery (GAS) on transgender and gender diverse individuals. Mental health outcomes are among the most vital end points to study, given the fundamental intent of GAS to provide patients with relief from gender dysphoria and improvement of psychosocial distress. Much of the data on this topic come from observational studies that lack either control groups or adequate sample size.[1,2] In this issue of *JAMA Surgery*, Almazan and Keuroghlian[3] contribute an analysis of the US Transgender Survey (USTS), examining the topic of mental health outcomes following GAS.

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This study[3] compared individuals who desired but had not undergone GAS with those who had, finding significantly lower rates of psychosocial distress, smoking, and suicidal ideation in the surgery group. When the analysis was broadened to include lifetime rather than recent symptoms (ie, the temporal association between surgery and symptoms was removed), the association became insignificant. The authors[3] concluded the significant associations were not because of prior mental health status but rather a result of surgical intervention.

We commend the authors[3] on their thorough exploration of the USTS, the largest collection of data on the experience of transgender and gender diverse individuals to our knowledge to date. They provide a controlled, well-powered study, and their findings align with prior studies demonstrating the efficacy of GAS. However, the largest challenge in interpreting this association lies in the mental health screening typically necessary to be a candidate for GAS, which may convolute the specific connection between these 2 variables. The authors have fashioned a surrogate temporal association from cross-sectional data, but it is one that inevitably depends on certain key assumptions to hold true.

The second challenge is the use of USTS survey questions to quantify psychosocial distress, rather than a validated outcome instrument targeted toward psychosocial assessment in the transgender and gender diverse population. This is not as much a critique of the method as an acknowledgment of the scarcity of prospective longitudinal data sets measuring robust outcomes. Prospective cohort-level analyses (rather than population-level analyses) with well-validated outcome instruments are widely recognized as the area requiring greater progress. In the interim, though, this report[3] contributes additional evidence to support the efficacy of GAS in alleviating dysphoria.

The availability of data on this community is a major impediment to addressing its needs and 1 reason the USTS was conducted in the first place, since nearly all governmental surveys continue to omit gender identity as a survey item. This issue has been recognized by numerous key public health

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institutions,[4,5] which call for increased funding for research on transgender-specific health needs to narrow this research gap.[6] We hope that as GAS becomes increasingly accessible, more robust data to support optimal, evidence-based guidelines for health of transgender and gender diverse individuals will continue to emerge.

ARTICLE INFORMATION

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Original Investigation | Equity, Diversity, and Inclusion

Patients' Perceived Level of Clinician Knowledge of Transgender Health Care, Self-rated Health, and Psychological Distress Among Transgender Adults

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Abstract

IMPORTANCE Transgender, gender nonbinary, and genderqueer people are at increased risk for negative health outcomes, and medical school education is currently lacking on inclusion of these topics. However, there is little evidence of an association of clinician knowledge with the health of transgender people.

OBJECTIVE To evaluate the associations of patients' perceptions of clinician knowledge with self-rated health and severe psychological distress among transgender people.

DESIGN, SETTING, AND PARTICIPANTS In this cross-sectional study, a secondary data analysis of the 2015 US Transgender Survey (a survey of transgender, gender nonbinary, and genderqueer adults conducted across 50 states) Washington, DC, US territories, and US military bases in 2015 was performed. Data were analyzed from February to November 2022.

EXPOSURES Patients' perception of their clinician's knowledge about transgender health care.

MAIN OUTCOMES AND MEASURES Self-rated health, dichotomized as poor or fair vs excellent, very good, or good, and severe psychological distress (scoring a validated threshold of ≥13 on the Kessler Psychological Distress Scale).

RESULTS The sample included a total of 27 715 respondents (9238 transgender women [33.3%; 55.1% weighted; 95% CI, 53.4%-56.7%], 22 658 non-Hispanic White individuals [81.8%; 65.6% weighted; 95% CI, 63.7%-67.5%], and 4085 individuals aged 45-64 years [14.7%; 33.8% weighted; 95% CI, 32.0%-35.5%]). Of 23 318 individuals who answered questions regarding their perceptions of their clinicians' level of knowledge, 5732 (24.6%) reported their clinician knows almost everything about transgender care, 4083 (17.5%) reported their clinician knows most things, 3446 (14.8%) reported their clinician knows some things, 2680 (11.5%) reported their clinician knows almost nothing, and 7337 (31.5%) reported they were unsure. Nearly 1 in 4 transgender adults (5612 of 23 557 individuals [23.8%]) reported having to teach their clinician about transgender people. In total, 3955 respondents (19.4%; 20.8% weighted; 95% CI, 19.2%-22.6%) reported fair or poor self-rated health and 7392 (36.9%; 28.4% weighted, 95% CI, 26.9%-30.1%) met the criteria for severe psychological distress. After adjusting for covariates, compared with individuals who reported their clinician knows almost everything about transgender care, exposure to clinicians with lower perceived levels of knowledge about transgender care was associated with significantly higher odds of fair or poor self-rated health (adjusted odds ratio [aOR] for knowing almost nothing, 2.63; 95% CI, 1.76-3.94; aOR for unsure, 1.81; 95% CI, 1.28-2.56) and severe psychological distress (aOR for knowing almost nothing, 2.33; 95% CI, 1.61-3.37; aOR for unsure, 1.37; 95% CI, 1.05-1.79). Respondents who had to teach a clinician about transgender people had higher odds of reporting fair

(continued)

Key Points

Question Is patients' perceived level of clinician knowledge about transgender care associated with the self-rated health of transgender people?

Findings In this cross-sectional analysis of 27 715 participants in the 2015 US Transgender Survey, transgender people who had to teach their clinician about transgender people had substantially higher levels of poor self-rated health and severe psychological distress than those who did not have to teach their clinician. Results were similar for transgender people who reported that their clinicians had less transgender-specific knowledge, compared with patients whose clinicians were perceived to have high levels of such knowledge.

Meaning These findings highlight the importance of integration and enhancement of transgender health in medical education curriculum as a necessary intervention to improve the health of transgender people.

+ Supplemental content

Author affiliations and article information are listed at the end of this article.

Abstract (continued)

or poor self-rated health (aOR, 1.67; 95% CI, 1.31-2.13) and severe psychological distress (aOR, 1.49; 95% CI, 1.21-1.83) compared with those who did not.

CONCLUSION AND RELEVANCE The findings of this cross-sectional study suggest that there is an association between perceived clinician knowledge about transgender people and self-rated health and psychological distress among transgender people. These results highlight the importance of integration and enhancement of transgender health in medical education curriculum as a necessary intervention to improve the health of transgender people.

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Introduction

Transgender, gender nonbinary, and genderqueer (henceforth, *transgender*) people are more likely to report adverse health outcomes than cisgender people.[1-4] For example, an estimated 22% of transgender people estimate their health as fair or poor compared with 18% of the overall US population, and 39% of transgender people currently meet the criteria for severe psychological distress (SPD) compared with 5% of the overall US population.[5] Long-term stressors, including restrictive policy environments, structural and interpersonal experiences of transphobia, discrimination, stigmatization, and gender minority stress[6] ("the social stressors specific to transgender and other gender minority people that result from gender-related discrimination, ... nonaffirmation of gender identity, internalized transphobia, ... community connectedness, and pride"), are important factors contributing to these adverse health outcomes.[7]

Medical education is an important step in addressing these adverse health outcomes and poor clinical experiences of transgender people. Recently graduated physicians interested in providing inclusive care have limited education on the needs of transgender people in their didactic years. In 2014, the Association of American Medical Colleges recognized this gap in medical education.[8] Their guidelines report that current curricula do not adequately address relevant topics such as gender-affirming care and social determinants of health affecting LGBTQAI (lesbian, gay, bisexual, transgender, queer [or questioning], asexual [or allied], intersex) persons.[8] Moreover, research regarding LGBTQIA health topics in medical education revealed that medical schools in the US include, on average, only 5 hours of LGBTQIA subject matter.[9] The limited coverage in medical education is confirmed by learners reporting a lack of competency in several LGBTQIA competencies, including taking a sexual history, discussing sexual orientation or gender identity, and all aspects (ie, medical, social, and mental) of gender affirming care.[10,11] Although medical schools have implemented various educational programming ranging from didactic lectures to patient panels, previous review on the content and subsequent quality of LGBTQIA-related material varies greatly across the US.[9]

Little is known regarding clinical perspectives on knowledge or training on transgender-related care, although recent work provides some insight. Among primary care clinicians in an integrated Midwest health system, 85.7% reported being willing to provide routine care to transgender people, and 78.6% reported a wiliness to provide Papanicolaou tests to transgender men.[12] Overall, 68.8% of primary care physicians reported feeling capable of providing routine care to transgender patients.[12] When assessing barriers to providing routine care for transgender people, however, 47.9% of primary care clinicians reported a lack of training on transgender health, 37.1% reported a lack of exposure to transgender patients, 32.1% reported a lack of knowledge about transgender care among their staff, and 52.1% reported a lack of familiarity with transition care guidelines.[12] It remains unclear how these competencies translate into providing care to transgender individuals.

Given recent state-level legislation targeting transgender people and transgender-inclusive health care, concerns about the mental health and well-being of transgender people have

heightened. In this study, we examine the association of patients' perceptions of their clinicians' knowledge about transgender health with self-rated health (SRH) and SPD among transgender people. Using the 2015 US Transgender Survey (USTS),[5] the largest and most recently available data set evaluating the lived experiences of transgender people in the US, we investigate 2 hypotheses. First, we hypothesize that greater perceived clinician knowledge regarding transgender health is associated with improved health, including SRH and SPD. Second, we hypothesize that transgender people having to teach their clinicians about transgender people is associated with greater odds of having poor SRH and greater odds of meeting the criteria for SPD.

Methods

Study Design

In this cross-sectional study, we performed a secondary data analysis of the 2015 USTS survey.[5] The protocol for this study was reviewed by the institutional review boards of the University of Alabama at Birmingham, Mississippi State University, and Utah State University and received exempt determinations for human participants research and the need for informed consent because the data were secondary and deidentified. This investigation is reported using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline for cross-sectional studies.

Study Population and Data Source

The 2015 USTS survey was developed and administered online by the National Center for Transgender Equality and includes responses from self-identified transgender, gender nonbinary, and genderqueer individuals aged 18 years and older residing in the US. Although it is a nonprobability sample, with 32 sections and 1140 variables, the USTS is the largest available data collection effort evaluating the lived experiences of self-identified transgender people in the US. Additionally, the USTS has respondents from all 50 states, Washington, DC, American Samoa, Guam, Puerto Rico, and US military bases overseas.[5] Since 2019, the data set has been archived at the Inter-University Consortium for Political and Social Research at the University of Michigan.[13] The USTS protocol was approved by the University of California, Los Angeles institutional review board.[5] Our analysis was based on subsamples of respondents for SRH models and SPD models, both representing the number of respondents with complete responses on all variables used.

Outcomes

We examined 2 binary outcomes. First, SRH was dichotomized as poor or fair vs excellent, very good, or good, following the analytic strategy of prior studies of SRH.[14-20] The second outcome was SPD, defined as scoring a validated threshold of 13 or greater on the Kessler Psychological Distress Scale.[21,22]

Exposures

The primary exposure of interest was patients' perceived clinician knowledge about transgender health care. This exposure is a composite measure built from responses to 3 questions: (1) "Thinking about the doctor or provider you go to for your trans-related health care (such as hormone treatment), how much do they know about providing health care for trans people?" (2) "Do you see your trans-related provider for routine care?" and (3) "How much does your routine health care provider (who you see for physicals, flu, diabetes, etc.) know about health care for trans people?" We used the level of perceived knowledge of clinicians who provided transgender-specific care for respondents who do not have a routine care clinician or who use their transgender-related care clinicians for routine care. We used the level of knowledge of routine care clinicians for respondents who only have a routine care clinician or who have a different clinician for transgender-related care vs

routine care. In secondary analysis (not shown), we considered separate models for transgender-related care clinicians and routine care clinicians. Ultimately, we combined transgender-related care and routine care clinician knowledge so that we could retain a larger analytic sample while capturing the overall experience with medical clinicians. Variable attributes included the patients' perception that the clinician (1) knows almost everything [about transgender-related care], (2) knows most things [about transgender-related care], (3) knows some things [about transgender-related care], (4) knows almost nothing [about transgender-related care], and (5) I am not sure.

In the second set of models, the primary exposure was whether respondents had taught their clinician about transgender-related care, a dichotomous measure in which respondents answered no (0) or yes (1) to the statement, "I had to teach my doctor or other health care provider about trans people so that I could get appropriate care" in the past year.

Covariates

Sociodemographic covariates examined include gender identity (transgender woman, transgender man, and gender nonbinary or genderqueer), age (18-24 years, 25-44 years, 45-64 years, and ≥65 years), marital status (married or cohabitating, never married, divorced, and widowed), and race and ethnicity. Race and ethnicity were determined by self-report, and were categorized as biracial or multiracial (indicating respondents who selected 2 or more racial and ethnic categories), Latinx or Hispanic, non-Hispanic American Indian or Alaska Native, non-Hispanic Asian American, non-Hispanic Black or African American, non-Hispanic Middle Eastern or North African, non-Hispanic Native Hawaiian or other Pacific Islander, and non-Hispanic White. Race and ethnicity were included to account for racial and ethnic disparities observed among the study sample.[5]

Socioeconomic covariates included education level (less than high school, high school diploma or general educational development, some college, associate's degree, bachelor's degree, and graduate or professional degree), employment status (employed or unemployed), and health insurance status (insured or uninsured). A control variable for using the same clinician was included, which measured whether the same clinician provided transgender-related care and routine care for respondents.

Statistical Analysis

All analyses were conducted using Stata statistical software version 17 (StataCorp)[23] using complex survey design (svy) procedures and weights created by the USTS that correct for purposive nonprobability sampling bias on race and ethnicity, age, and education level. Weighted descriptive statistics were calculated and are presented for variables included in models. Due to the dichotomous nature of both outcome variables, binary logistic models were estimated to test whether exposures of interest were associated with outcomes, and were expressed in adjusted odd ratios (aORs). The aORs with 95% CIs and 2-sided *P* values are reported with a $P < .05$ threshold for significance. Respondents with missing data for exposure and outcome variables were excluded without compensatory methods.[24] Data were analyzed from February to November 2022.

Results

The 2015 USTS survey included responses from 27 715 transgender, gender nonbinary, and genderqueer individuals (9238 transgender women [33.3%; 55.1% weighted; 95% CI, 53.4%-56.7%], 22 658 non-Hispanic White individuals [81.8%; 65.6% weighted; 95% CI, 63.7%-67.5%], and 4085 individuals aged 45-64 years [14.7%; 33.8% weighted; 95% CI, 32.0%-35.5%]). A total of 19 463 respondents (70.2%; 52.0% weighted; 95% CI, 50.4%-53.7%) reported their marital status as never married, 26 809 (96.7%; 85.6% weighted; 95% CI, 83.4%-87.5%) had a high school diploma or higher, 24 211 (87.4%; 85.1% weighted; 95% CI, 83.9%-86.3%) had health insurance, and 18 000 (65.0%; 59.1% weighted; 95% CI, 57.3%-60.9%) were employed. The subsamples for this study included 20 381 respondents for SRH models and 20 037 respondents for SPD models. Almost

one-half of respondents (12 655 respondents [45.7%]) reported not having a transgender-related care clinician, 4119 respondents (14.9%) lacked a routine care clinician, and 7465 respondents (26.9%) used the same clinician for transgender-related and routine care.

Of 23 318 individuals who answered questions regarding their perceptions of their clinicians' level of knowledge, 5732 (24.6%) reported their clinician knows almost everything about transgender care, 4083 (17.5%) reported their clinician knows most things, 3446 (14.8%) reported their clinician knows some things, 2680 (11.5%) reported their clinician knows almost nothing, and 7337 (31.5%) reported they were unsure. **Table 1** provides the results of the descriptive analysis. The 2 outcomes, SRH and SPD, varied by perceived level of clinician knowledge. The proportion of respondents reporting fair or poor SRH and SPD increased with lower levels of clinician knowledge. Nearly a quarter of respondents (5,612 respondents [23.8%]) in the study sample had to teach their clinician about transgender-related care. Among 5,612 respondents who had to teach their clinician about transgender care, 1341 respondents (23.9%) reported fair or poor SRH and 2209 (40.1%) met the criteria for SPD.

Table 2 and **Table 3** present the results of the regression analysis. After adjusting for sociodemographic and socioeconomic covariates, exposure to a clinician with lower perceived levels of knowledge about transgender-related care was associated with higher odds of poor or fair SRH and SPD. Respondents who reported their clinician knew some things (aOR, 1.45; 95% CI, 1.09-1.93; $P = .01$), knew almost nothing (aOR, 2.63; 95% CI, 1.76-3.94; $P < .001$), and were not sure how much their clinician knew about transgender-related care (aOR, 1.81; 95% CI, 1.28-2.56; $P < .001$) were more likely to report poor or fair SRH compared with respondents who reported their clinician knew almost everything about transgender-related care. Similarly, respondents who reported their clinician knew some things (aOR, 1.35; 95% CI, 1.07-1.70; $P = .01$), knew almost nothing (aOR, 2.33; 95% CI, 1.61-3.37; $P < .001$), and were not sure how much their clinician knew (aOR, 1.37; 95% CI, 1.05-1.79; $P = .02$) were more likely to report SPD compared to respondents who reported their clinician knew almost everything about transgender-related care. Respondents who had to teach a clinician about transgender-related care had higher odds of reporting poor or fair SRH (aOR, 1.67; 95% CI, 1.31-2.13; $P < .001$) and SPD (aOR, 1.49; 95% CI, 1.21-1.83; $P < .001$) compared with respondents who did not have to teach their clinician about transgender-related care (Table 3).

Discussion

To our knowledge, this is the first large-scale study to demonstrate an association of perceived clinician knowledge about transgender people and transgender health with health outcomes of transgender people. In this cross-sectional study, we found that greater perceived clinician knowledge was associated with higher odds of reporting better SRH and lower odds of reporting SPD among transgender people. Nearly 1 in 4 transgender people reported having to teach their clinician about transgender people, and more than 1 in 2 transgender people reported that their clinician appeared to know almost nothing about health care for transgender people.

This perceived lack of knowledge about transgender people and health care for transgender people among clinicians was negatively associated with SRH and SPD. Although this association remained after controlling for a host of covariates, we stop short at suggesting the education of clinicians alone will improve the mental and overall health of transgender people. Importantly, other factors contribute to the adverse health outcomes of transgender patients. Restrictive state policy environments are associated with poor health and less access to care for transgender people.[25-28] Experiences of discrimination, stigmatization, and gender minority stress outside the health care context are also associated with negative health outcomes.[7] Among primary care clinicians in an integrated health care system in the US Midwest, increasing hours of transgender health care education was not significantly associated with knowledge about transgender health care.[29] However, transphobia was significantly associated with clinician knowledge, suggesting that

Table 1. Respondent Demographics and Patients' Perceived Level of Clinician Knowledge of Transgender Health Care[a]

Characteristic	Respondents, No. (%)						
	Patients perceived level of clinician knowledge of transgender care (n = 23 318)					Had to teach clinician about transgender care (n = 23 557)	
	Knows almost everything (n = 5732)	Knows most things (n = 4083)	Knows some things (n = 3446)	Knows almost nothing (n = 2680)	I'm not sure (n = 7377)	No (n = 17 945)	Yes (n = 5612)
Self-rated health							
Excellent, very good, or good	5039 (87.9)	3511 (86.0)	2793 (81.1)	1839 (68.6)	5660 (68.6)	14582 (81.3)	4268 (76.1)
Fair or poor	690 (12.0)	569 (13.9)	653 (18.9)	838 (31.3)	1715 (23.2)	3355 (18.7)	1341 (23.9)
Kessler Psychological Distress Scale score indicating severe psychological distress							
No	4163 (72.6)	2795 (68.5)	2231 (64.7)	1277 (47.6)	4040 (54.8)	11229 (62.6)	3294 (58.7)
Yes	1452 (25.3)	1212 (29.7)	1156 (33.5)	1355 (50.6)	3210 (43.5)	6421 (35.8)	2209 (39.4)
Sees same clinician for transgender-related and routine care							
No	2750 (48.0)	2006 (49.1)	2001 (58.1)	2128 (79.4)	6872 (93.2)	12831 (71.5)	3402 (60.6)
Yes	2965 (51.7)	2067 (50.6)	1440 (41.8)	540 (20.1)	370 (5.0)	5005 (27.9)	2190 (39.0)
Gender identity							
Transgender woman	2827 (49.3)	1940 (47.5)	1383 (40.1)	790 (29.5)	1256 (17.0)	5990 (33.4)	2082 (37.1)
Transgender man	2238 (39.0)	1544 (37.8)	1257 (36.5)	783 (29.2)	1166 (15.8)	4785 (26.7)	2240 (39.9)
Gender nonbinary or genderqueer	639 (11.1)	575 (14.1)	766 (22.2)	1049 (39.1)	4470 (60.6)	6608 (36.8)	1275 (22.7)
Race and ethnicity							
American Indian or Alaska Native	58 (1.0)	39 (1.0)	58 (1.7)	59 (2.2)	59 (0.8)	175 (1.0)	106 (1.9)
Asian American	138 (2.4)	84 (2.1)	87 (2.5)	71 (2.6)	221 (3.0)	489 (2.7)	110 (2.0)
Biracial or multiracial[b]	264 (4.6)	192 (4.7)	176 (5.1)	170 (6.3)	418 (5.7)	929 (5.2)	306 (5.5)
Black or African American	219 (3.8)	107 (2.6)	77 (2.2)	61 (2.3)	179 (2.4)	502 (2.8)	149 (2.7)
Hispanic or Latinx	306 (5.3)	179 (4.4)	171 (5.0)	128 (4.8)	421 (5.7)	917 (5.1)	264 (4.7)
Middle Eastern or North African	20 (0.3)	19 (0.5)	DS[c]	DS[c]	DS[c]	77 (0.4)	32 (0.6)
Native Hawaiian or other Pacific Islander	17 (0.3)	11 (0.3)	DS[c]	DS[c]	DS[c]	41 (0.2)	11 (0.2)
White	4710 (82.2)	3452 (84.5)	2856 (82.9)	2167 (80.9)	6039 (81.9)	14815 (82.6)	4634 (82.6)
Age, y							
18-44	4358 (76.0)	3215 (78.7)	2631 (76.3)	2209 (82.4)	6355 (86.1)	14579 (81.2)	4560 (81.3)
45 to 64	1156 (20.2)	743 (18.2)	690 (20.0)	394 (14.7)	798 (10.8)	2754 (15.3)	920 (16.4)
≥65	218 (3.8)	125 (3.1)	125 (3.6)	77 (2.9)	224 (3.0)	612 (3.4)	132 (2.4)
Marital status							
Married or cohabitating	1278 (22.3)	865 (21.2)	789 (22.9)	489 (18.2)	1185 (16.1)	3429 (19.1)	1163 (20.7)
Never married	3555 (62.0)	2623 (64.2)	2133 (61.9)	1911 (71.3)	5690 (77.1)	12532 (69.8)	3660 (65.2)
Divorced	748 (13.0)	484 (11.9)	437 (12.7)	229 (8.5)	378 (5.1)	1603 (8.9)	651 (11.6)
Widowed	66 (1.2)	32 (0.8)	31 (0.9)	22 (0.8)	51 (0.7)	157 (0.9)	43 (0.8)
Education level							
Less than high school	120 (2.1)	75 (1.8)	58 (1.7)	107 (4.0)	342 (4.6)	562 (3.1)	137 (2.4)
High school diploma or general educational development	570 (9.9)	336 (8.2)	305 (8.9)	353 (13.2)	1172 (15.9)	2190 (12.2)	503 (9.0)
Some college	1861 (32.5)	1349 (33.0)	1200 (34.8)	1074 (40.1)	3201 (43.4)	6839 (38.1)	1973 (35.2)
Associate's degree	561 (9.8)	362 (8.9)	313 (9.1)	235 (8.8)	523 (7.1)	1467 (8.2)	512 (9.1)
Bachelor's degree	1671 (29.2)	1269 (31.1)	924 (26.8)	590 (22.0)	1497 (20.3)	4537 (25.3)	1550 (27.6)
Graduate or professional degree	949 (16.6)	692 (16.9)	646 (18.7)	321 (12.0)	642 (8.7)	2350 (13.1)	937 (16.7)
Has health insurance							
No	475 (8.3)	355 (8.7)	295 (8.6)	282 (10.5)	474 (6.4)	1677 (9.3)	505 (9.0)
Yes	5250 (91.6)	3727 (91.3)	3147 (91.3)	2395 (89.4)	6878 (93.2)	16235 (90.5)	5102 (90.9)
Employment							
Employed	4141 (72.2)	2938 (72.0)	2370 (68.8)	1600 (59.7)	4215 (57.1)	11633 (64.8)	3790 (67.5)
Unemployed	1566 (27.3)	1126 (27.6)	1064 (30.9)	1070 (39.9)	3121 (42.3)	6232 (34.7)	1799 (32.1)

Abbreviation: DS, data suppressed.

[a] Column percentages may not add up to 100% because missing data are not displayed.

[b] Biracial or multiracial indicate respondents who selected 2 or more racial and ethnic categories.

[c] Data suppressed for privacy purposes.

increased education alone may be insufficient in addressing the lack of knowledge about transgender care among health care clinicians.[29]

Nevertheless, the integration of education surrounding transgender people and transgender health disparities is an important step to address ongoing health disparities transgender populations face. Patients benefit from clinicians trained to understand the health disparities experienced by transgender people and to use best communication practices for these patients. Kattari et al[30] explored the association of transgender individuals seeking inclusive clinicians with changes in mental health outcomes. Their results indicate that transgender individuals who saw a gender-inclusive clinician and had preexisting mood disorders showed almost a 50% decrease in suicidality, defined as having suicidal thoughts within the past year.[30] Ultimately, incorporating more LGBTQAI health topics and considerations on social determinants of health into the medical curriculum provides positive outcomes for learners and future patients.[31,32]

Strengths and Limitations

The current study has several strengths worth highlighting. First, we used the largest available data set evaluating the lived experiences and health of transgender, gender nonbinary, and genderqueer people in the US.[5] The data included respondents from all 50 US states, Washington, DC, and American territories and military bases overseas. Second, this study is the first, to our knowledge, to examine the association of perceived clinician knowledge about transgender health with SRH and SPD among transgender people. Examining this association allows us to better understand the roles that medical education and clinician training play in the everyday health status of transgender people. Finally, we included a host of sociodemographic and socioeconomic covariates in our models, which the literature indicate are directly associated with health.[5] Although these covariates slightly attenuated effect sizes, statistical significance remained in adjusted models.

Table 2. Association of Patients' Perception of Clinician Knowledge About Transgender Care With Poor or Fair SRH and SPD[a]

Patients' perception of clinician's knowledge about transgender care[b]	SRH[c]		SPD[d]	
	aOR (95% CI)	*P* value	aOR (95% CI)	*P* value
Knows most things	1.18 (0.85-1.64)	.33	1.28 (0.97-1.67)	.08
Knows some things	1.45 (1.09-1.93)	.01	1.35 (1.07-1.70)	.01
Knows almost nothing	2.63 (1.76-3.94)	<.001	2.33 (1.61-3.37)	<.001
I'm not sure	1.81 (1.28-2.56)	<.001	1.37 (1.05-1.79)	.02

Abbreviations: aOR, adjusted odds ratio, SPD, severe psychological distress, SRH, self-rated health.

[a] Adjusted for same clinician, gender identity, race and ethnicity, age, marital status, education level, insurance status, employment status.

[b] Reference for knowledge about transgender care is knows almost everything.

[c] Refers to poor or fair SRH vs good, very good, or excellent SRH (N = 20 381).

[d] SPD is defined as a score of 13 or higher on the Kessler Psychological Distress Scale (N = 20 037).

Table 3. Association of Having to Teach Clinician About Transgender People with Poor/Fair SRH and SPD[a]

Outcome	aOR (95% CI)	*P* value
Poor or fair self-rated health[c]	1.67 (1.31-2.13)	<.001
Severe psychological distress[d]	1.49 (1.21-1.83)	<.001

Abbreviations: aOR, adjusted odds ratio, SPD, severe psychological distress, SRH, self-rated health.

[a] Adjusted for same clinician, gender identity, race and ethnicity, age, marital status, education level, insurance status, employment status.

[b] Reference for knowledge about transgender care is knows almost everything.

[c] Refers to poor or fair SRH vs good, very good, or excellent SRH (N = 20 381).

[d] SPD is defined as a score of 13 or higher on the Kessler Psychological Distress Scale (N = 20 037).

The study is limited by its cross-sectional study design as well as nonprobability sampling technique. The USTS lacks racial and ethnic diversity with the majority of the sample being White; Black and Latinx populations are largely underrepresented. As a result, the weighting procedure used by the USTS presents concerns, primarily because the weighting procedures are based on the general US population; it is possible that the distribution of race and ethnicity, age, and education level would be different in the transgender population than the general US population.[33] In addition, our primary exposure variable measures the individual's perceptions of their clinician's knowledge about transgender health rather than the clinician's self-reporting of their education and training. However, our results indicate an association of diminished health status with perceived clinician knowledge, indicating that perception does matter. Additionally, our models include whether a transgender person reported having to teach their clinician about transgender people, which is potentially a more definitive measure of clinician knowledge because this variable is most likely dependent on whether a respondent needed their clinician to know new information or act differently. For example, respondents had to inform their clinicians about the expected protocols related to transgender health, including monitoring testosterone levels and risk of cardiac disease among transgender men.

Conclusions

In this cross-sectional study of transgender, nonbinary, and genderqueer adults, we found that patients' perceived levels of knowledge clinicians had about transgender people and providing transgender health care was associated with health outcomes of transgender people. Our results demonstrate that transgender people who had to teach their clinicians about transgender people and who reported their clinicians had lower levels of knowledge about transgender health care were at significantly higher odds of reporting fair or poor SRH and were at significantly higher odds of meeting the criteria for SPD. These findings provide empirical evidence to support the integration and enhancement of transgender health care and the impacts of gender identity in the medical education curriculum as a necessary intervention to improve the health of transgender, gender nonbinary, and genderqueer people.

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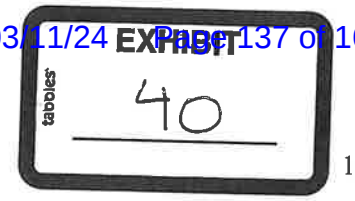
SUPPLEMENT 1.
Data Sharing Statement



Effects of Different Steps in Gender Reassignment Therapy on Psychopathology: A Prospective Study of Persons with a Gender Identity Disorder

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ABSTRACT

Introduction. At the start of gender reassignment therapy, persons with a gender identity disorder (GID) may deal with various forms of psychopathology. Until now, a limited number of publications focus on the effect of the different phases of treatment on this comorbidity and other psychosocial factors.

Aims. The aim of this study was to investigate how gender reassignment therapy affects psychopathology and other psychosocial factors.

Methods. This is a prospective study that assessed 57 individuals with GID by using the Symptom Checklist-90 (SCL-90) at three different points of time: at presentation, after the start of hormonal treatment, and after sex reassignment surgery (SRS). Questionnaires on psychosocial variables were used to evaluate the evolution between the presentation and the postoperative period. The data were statistically analyzed by using SPSS 19.0, with significance levels set at $P < 0.05$.

Main Outcome Measures. The psychopathological parameters include overall psychoneurotic distress, anxiety, agoraphobia, depression, somatization, paranoid ideation/psychoticism, interpersonal sensitivity, hostility, and sleeping problems. The psychosocial parameters consist of relationship, living situation, employment, sexual contacts, social contacts, substance abuse, and suicide attempt.

Results. A difference in SCL-90 overall psychoneurotic distress was observed at the different points of assessments ($P = 0.003$), with the most prominent decrease occurring after the initiation of hormone therapy ($P < 0.001$). Significant decreases were found in the subscales such as anxiety, depression, interpersonal sensitivity, and hostility. Furthermore, the SCL-90 scores resembled those of a general population after hormone therapy was initiated. Analysis of the psychosocial variables showed no significant differences between pre- and postoperative assessments.

Conclusions. A marked reduction in psychopathology occurs during the process of sex reassignment therapy, especially after the initiation of hormone therapy. **Heylens G, Verroken C, De Cock S, T'Sjoen G, and De Cuypere G. Reassignment therapy on psychopathology: A prospective study of persons with a gender identity disorder. J Sex Med 2014;11:119–126.**

Key Words. Gender Reassignment Therapy; Psychopathology; Gender Identity Disorder; Gender Dysphoria

Introduction

According to the DSM-IV-R classification, transsexualism or gender identity disorder (GID) is an extreme form of gender dysphoria characterized by a strong and persistent identification with the opposite sex. It is accompanied by the wish to get rid of one's own primary and secondary sex characteristics and to live completely as someone from the opposite sex [1]. In Belgium, the prevalence is around 7.75 male-to-female (MtF) and 2.96 female-to-male (FtM) per 100,000, which is similar to other Western European countries [2].

The etiology of transsexualism remains unclear. Besides biological factors, such as hormonal

abnormalities, morphology of sexual dimorphic brain nuclei, and genetic elements [3–8], psychological and sociocultural factors also seem to be important [3,4].

As far as the therapy for GID is concerned, most countries adopt the standards of care from the World Professional Association for Transgender Health. These standards comprise a variety of therapeutic options, including changes in gender expression and role, hormone therapy, surgery, and psychotherapy. The number and type of interventions applied, and the order in which these take place, may differ from person to person [9]. Most of the persons with GID who attend our clinic wish full sex reassignment including genital surgery, and start with hormonal treatment.

Previous research on the relationship between GID and psychiatric comorbidity has led to divergent conclusions. Some studies suggest that GID is frequently associated with severe psychiatric comorbidity, both on axis 1 and 2, from psychoses and major affective disorders [10,11] to severe personality disorders [12,13]. Others show little or no raised levels of psychopathology in transsexual populations [14–16]. A moderate view is that persons with GID may show more psychopathology, yet no severe neurotic or psychotic disorders [17,18]. Of the various symptoms, depression, anxiety disorders, and adjustment disorders are the most common, followed by substance abuse, suicide, and automutilation [1,17–19]. Due to the incongruence between biological sex and gender identity, many persons with GID also have a disturbed body image, which makes them frequently insecure [20]. These findings imply the existence of a link between gender dysphoria and psychiatric disorders, but do not reveal any information about causality.

In the past decades, various studies have been performed to investigate the effects of sex reassignment therapy on psychological status and psychosocial aspects. In the early years, the number of patients was often small and most of the studies did not employ standardized outcome instruments. In 1990, Green and Fleming reviewed the preceding literature and found out that sex reassignment was effective in reducing gender dysphoria and general well-being [21]. In particular, they emphasized the importance of standardized selection criteria for surgery and the use of standardized instruments for outcome measurement. Green and Fleming's conclusions were reaffirmed by Pfafflin and Junge in their review of approximately 70 outcome studies published between 1961 and 1991 [22].

More recently, Smith et al. prospectively studied the outcomes of sex reassignment and concluded that treatment had a positive effect on gender dysphoria, psychological and social well-being, and sexual satisfaction [23]. Similar results were found in the follow-up study by De Cuypere et al., who especially focused not only on sexuality but also on general health and satisfaction with surgical results [24]. Gomez-Gil et al. [25] showed that persons with GID under hormone therapy scored significantly lower on several Minnesota Multiphasic Personality Inventory scales than patients who had not started hormone treatment yet. Contrary to these results, Haraldsen and Dahl, however, could not find any significant difference when comparing Symptom Checklist-90 (SCL-90) scores in pre- and postoperative patients [26]. Murad et al. [27] and Gys and Brewaeys [28] offered, respectively, comprehensive reviews of studies between 1966 and 2008 and after 1990, and emphasized again the lack of standardization. The American Psychiatric Association Task Force on treatment of GID uses their evidence coding system to evaluate studies concerned with treatment issues: most evidence is on at or below level C (cohort or longitudinal study) (refer to Byne et al. for further reading) [29]. The only controlled study on the effectiveness of sex reassignment surgery (SRS) was conducted by Mate-Kole et al. who compared a waiting list condition with a treatment condition and found better results in the postoperative groups, with the group reporting more social and sexual activity, better employment rates, and lower levels of psychoneurotic pathology indicated by Crown-Crisp Experiential Index scores [30]. Another study from Mate-Kole et al. compared GID patient groups before treatment, during hormone therapy and after SRS and showed that a bigger improvement occurs after SRS than after changing the gender role [31]. This suggests that the effect of sex reassignment on psychological status varies in different phases of the process.

The gender identity clinic of the Ghent University Hospital, Belgium, has evaluated and treated persons with GID since 1985. In the past decade, the number of applicants seeking treatment has increased from 35 to 85 per year in 2012. Eighty-five percent of the applicants come from Flanders, the Dutch speaking part of Belgium. The remaining 15% lives in the French-speaking part. Our clinic has an unique position in Belgium as it offers the full range of diagnostic evaluation and psychotherapeutic support, hormonal

treatment, and surgical interventions. Most of the persons attending our clinic are self-referred or referred by an professional caregiver, about two-thirds presents as a member of identified gender and is, at least partially, in their social transition phase. They are often well informed about treatment modalities, and the majority asks for hormonal and surgical treatment. Costs of psychiatric consultations, hormonal therapy, genital surgery, and breast augmentation and removal are reimbursed. Costs of facial hair removal, female feminization surgery, and speech therapy are not covered.

Aims

Due to a significant improvement of the methodological quality of research on the outcome of sex reassignment, the question no longer centers on whether it helps, but on which part of the treatment is responsible for the biggest improvement in terms of quality of life and reducing psychosocial problems. This study aims to shed light on the differentiating effects of gender reassignment treatment by measuring, in a prospective way, the evolution in psychopathological status during different phases of sex reassignment. Additionally, postoperative results are compared with those of general population in order to investigate whether psychopathology disappears together with sex reassignment therapy, or remains present, albeit possibly to a lesser extent.

Methods

Population

Between June 2005 and March 2009, 90 patients who applied for sex reassignment therapy at our Gender Clinic were asked to participate in this prospective study. Eight patients refused to participate or attended our clinic only once. Eighty-two agreed to participate in the study and were included after giving their informed consent. Twelve patients that were diagnosed with a gender identity disorder not otherwise specified were excluded. Of the remaining 70, all diagnosed with GID, but 12 patients did not undergo full treatment (hormonal and surgical) for several reasons: some were refused because of extensive comorbidity (two individuals with personality disorder, one with acquired brain injury), while others decided for themselves not to start treatment, or desired hormone therapy alone without feeling the need for genital surgery. One patient committed suicide during follow-up. In the end, 57 patients (46 MtF and 11 FtM) filled out the questionnaires, which is described below. The study was approved by the local ethics committee.

Questionnaires

SCL-90, Dutch Adapted Version

The SCL-90 is a widely used 90-item questionnaire consisting of eight subscales (agoraphobia, anxiety, depression, somatization, paranoid ideation/psychoticism, interpersonal sensitivity, hostility, and sleeping problems) and a global score called psychoneuroticism. Higher scores on the global score indicate a higher level of psychopathology. We used the norm group "general population" to compare with the postoperative results from our study population [32,33].

Psychosocial Questionnaires

To obtain the desired information on several demographic and psychosocial parameters, we developed a short questionnaire on employment, living arrangements, sexual orientation, relationships and sexual contacts, social contacts, substance abuse, and suicide thoughts/attempts. This questionnaire was based on the biographic questionnaire patients filled out at the first treatment attendance. The subjective evolution of mood, happiness, anxiety, self-esteem, and body image was also investigated.

Procedure

The study was conducted in a follow-up design. We used the SCL-90 to evaluate psychopathological evolution, with baseline assessment at the time of presentation. Follow-up assessment consists of two moments of measurement: 3–6 months after the start of hormone treatment and 1–12 months after SRS. Psychosocial questionnaires were sent to all patients, and the results were examined in consideration of the biographic data that were collected at the time of presentation. The mean follow-up between the first and the last assessment was 39 months (standard deviation 12.7). The data collection is summarized in Table 1. As all patients completed the gender reassignment treatment, except for 11 patients who did not yet receive SRS when we ended the data collection, there were no dropouts in the study population. Missing data are due to incomplete questionnaires. The response rates for SCL-90 and psychosocial questionnaires were 82.5% and 73.7%, respectively.

Table 1 Data collection

	SCL-90			Psychosocial data	
	Presentation	Follow-up		Presentation	Follow-up
Study group (n = 57)	56*	After HT 47†	After SRS 42‡	54§	42¶

*No baseline SCL-90 assessment was collected from one patient.
†Ten patients did not complete an SCL-90 after hormone therapy.
‡Eleven patients did not yet receive SRS when the data collection was ended. Four others did not complete an SCL-90 after SRS.
§No baseline psychosocial data were collected from three patients.
¶Psychosocial questionnaires were not sent to 11 patients who did not yet receive surgery. Four others did not complete the psychosocial questionnaire.
SRS = sex reassignment surgery; HT = hormone treatment

Statistics

SPSS 19.0 (SPSS Inc., Chicago, IL, USA) was used to construct a database and perform statistical analyses. A Friedman test was chosen to globally compare SCL-90 scores in the three assessment points, while Wilcoxon tests were used to further compare SCL-90 scores between two assessment points. McNemar and Fisher's exact tests were adopted for comparison of demographic and psychosocial parameters. The significance level was set at $P < 0.05$.

Results

SCL-90

Mean SCL-90 scores are shown in Table 2. Analyses show that a difference exists between the overall psychoneurotic distress scores at the several assessments ($P = 0.003$). Further analysis shows this is due to a decrease in the scores after hormone therapy ($P < 0.001$). No further decrease is observed after SRS. The effect of complete treatment is not more pronounced than that of hormone therapy alone. With regard to the different subscales, differences are found between the measurement points "baseline" and "after SRS" for anxiety ($P < 0.001$), depression ($P = 0.001$), interpersonal sensitivity ($P = 0.005$), and hostility ($P = 0.008$).

Table 2 shows that, unlike scores at time of presentation, SCL-90 scores after hormonal treatment and after surgery are similar to the mean SCL-90 scores of a general population. At the subscale level, the only exceptions are sleeping problems ($P = 0.033$) and, to an almost significant level, psychoticism ($P = 0.051$): after SRS, both are higher compared with a general population. Somatization, that was lower compared with a general population after hormone therapy, settles down to normative levels after SRS.

Psychosocial Questionnaires

Baseline and follow-up demographic and psychosocial parameters are summarized in Table 3. None of the variables show any significant difference between baseline and follow-up. Nonetheless, some tendencies can be distinguished, such as an increase in social contacts and a decrease in substance abuse leading to potentially the complete disappearance of drug abuse. Living

Table 2 Mean SCL-90-scores of "treated population" vs. "general population"

		Study group					
SCL-90 subscale	General population (SD)	Baseline (SD) n = 56	*P*	After hormone therapy (SD) n = 47	*P*	After SRS (SD) n = 42	*P*
ANG [10–50]	12.8 (4.4)	17.0 (6.4)	<0.001	12.4 (5.1)	0.220	13.5 (4.2)	0.286
AGO [7–35]	7.9 (2.3)	9.5 (4.2)	0.065	8.1 (1.8)	0.402	8.2 (2.0)	0.264
DEP [16–80]	21.6 (7.6)	34.7 (14.3)	<0.001	23.8 (9.0)	0.090	24.4 (9.2)	0.086
SOM [12–60]	16.7 (5.3)	18.6 (6.7)	0.042	15.2 (2.7)	<0.001	17.1 (6.2)	0.453
IN [9–45]	12.6 (4.3)	16.6 (7.0)	<0.001	12.8 (4.4)	0.359	15.1 (6.7)	0.051
SEN [18–90]	24.1 (7.6)	31.8 (11.7)	<0.001	24.6 (7.9)	0.277	25.8 (7.1)	0.097
HOS [6–30]	7.2 (2.1)	8.2 (3.0)	<0.001	7.4 (2.0)	0.181	7.2 (1.8)	0.237
SLA [3–15]	4.5 (2.2)	5.8 (3.2)	<0.001	4.4 (1.7)	0.192	5.2 (3.4)	*0.033*
NEUR [90–450]	**118.3 (32.4)**	**157.7 (49.8)**	**<0.001**	**119.7 (32.1)**	**0.359**	**127.9 (37.2)**	**0.082**

P values show differences between "treated population" and "general population."
AGO = agoraphobia; ANG = anxiety; DEP = depression; HOS = hostility; IN = paranoid ideation/psychoticism; NEUR = overall psychoneurotic distress; SCL-90 = Symptom Checklist-90; SD = standard deviation; SEN = interpersonal sensitivity; SLA = sleeping problems; SOM = somatization

Table 3 Socio-demographic and sexual parameters at time of presentation and at follow-up

	Presentation (n = 54)		Follow-up (n = 42)	
	n	%	n	%
Relationship				
None	32	58.2	22	52.4
Stable	22	44.0	18	42.6
Variable	1	1.8	2	4.8
Living situation				
Alone	18	32.1	18	42.9
With partner	21	37.5	16	38.1
With parents	15	26.8	5	11.9
Other	2	3.6	3	7.1
Employment				
Employed	37	66.1	25	59.5
Unemployed	9	16.1	6	14.3
Other (student, retirement, etc.)	10	17.9	11	26.2
Sexual contacts				
None	21	38.2	20	47.6
Only in a stable relationship	25	45.5	19	45.2
Variable	9	16.4	3	7.1
Social contacts				
Good friends	41	73.2	37	88.1
Superficial acquaintances	8	14.3	3	7.1
None	7	12.5	2	4.8
Drugs				
Alcohol abuse	8	14.8	1	2.4
Cannabis	4	7.4	0	0
Other drugs	2	3.7	0	0
Suicide attempt	5	9.4	4	9.3

situations changed with more people living alone and fewer with their parents. Also, "other" employment went up while employment went down. Reports of no sexual relationship went up, while the prevalence of suicide attempts did not change.

After treatment, the majority of patients indicated that they have a better mood, are happier, and feel less anxious than before (Table 4). They also seem to be more self-confident and encounter a better body-related experience, indicating a less distorted self-image than before treatment.

Most patients (57.9%) subjectively experienced the biggest progress after the start of hormone therapy. 31.6% felt the biggest evolution after SRS and 10.5% already noticed the most important change during the diagnostical phase.

Discussion

Analysis of the SCL-90 scores in the treated group has shown that sex reassignment therapy does influence the level of psychopathology in GID patients, with significant reduction in anxiety, depression, somatization, psychoticism, interpersonal sensitivity, hostility, and overall psychoneurotic distress. Although not strictly comparable, results of lower levels of psychopathology in postoperative transsexuals are consonant with other studies or reviews that use independent pre- and postoperative groups [21–25,27]. The findings that, after SRS, somatization is returning to normal again and psychoticism is almost higher compared with a general population ($P = 0.051$) could be explained by an initial euphoria caused by the relief they experience after starting hormonal treatment. Furthermore, sleeping problems become significantly higher after SRS compared with a general population. After SRS, transpeople probably experience more distress as they are again confronted with stigma and other burdens.

While Mate-Kole et al. suggested the most important factor to be SRS [31], we found that the biggest decrease in psychological dysfunctioning is caused by initiation of hormone therapy or confirmation of the diagnosis by a professional caregiver. This finding was consistent with the subjective feeling of most treated patients and suggests that recognition and acceptation of the GID play an important role in their transition process.

The comparison of pre- and postoperative SCL-90 scores with the mean score of a general population provided further information on the effect of treatment. In agreement with several other studies [10–12,17,18], our GID population scored significantly higher on psychopathology than a general population at the time of presentation, while that difference completely disappeared

Table 4 Subjective psychological evolution since presentation and suicide thoughts at the moment of follow-up

	Study group (n = 42)	
	n	%
Mood		
Better	40	95.2
Similar	2	4.8
Happiness		
Happier	39	92.9
Similar	0	0.0
Less happy	0	0.0
Anxiety		
Less anxious	34	81.0
Similar	6	14.3
More anxious	2	4.8
Self-confidence		
More self-confident	33	78.6
Similar	8	19.0
Less self-confident	1	2.4
Body-related experience		
Better	41	97.6
Similar	1	2.4
Suicide thoughts	7	16.7

after hormonal treatment. This finding implies the existence of a relationship between gender dysphoria and psychiatric comorbidity, and suggests that treatment not only causes a decrease in the gender dysphoria, as documented in other studies [21–23], but also a resolution of concomitant psychopathology.

The distinguished trends in demographic and psychosocial parameters are comparable with some findings in literature [23,24]. The presumption that sex reassignment has a positive influence on employment [30,34] could not be confirmed, probably due to the relatively short follow-up period. The finding that regular employment goes down, and "other" employment goes up, could fit in the daily practice observation that transpeople quit with their former jobs and start studying again. Compared with previous literature results that detected substance abuse in up to 60% of GID patients [11,12], we noticed very little abuse in our population. Possible explanations could be that our population was relatively small and the question rather subjective, and that problematic abuse forms a relative contraindication for sex reassignment therapy. Both suicide attempt percentages (10.9% at time of presentation, 9.8% at follow-up) were also slightly lower than those described in literature [16]. The latter finding is in accordance with some recent studies with regard to the high prevalence of suicidality in transpeople, even after their sex reassignment therapy [35].

The strengths of this study lie in its follow-up design and the size of the population. The study population of 57 participants represents one of the larger studies of its kind. To our knowledge, it is the first publication that focuses on the effects of the separate parts of the sex reassignment therapy. Nevertheless, several limitations can be discussed. We are acutely aware of the presence of selection bias: a significant percentage of gender dysphoric people never attends our or "a" gender clinic and this may be accounted for several reasons, including psychosocial factors. The used questionnaires form another source of bias: SCL-90 results are based on a "snapshot" measurement that may not be representative of one's general mental state. Furthermore, the follow-up period was too short to evaluate the effects of treatment on outcome measures as work and relationships. Finally, we certainly have to allow for the spontaneous evolution of complaints due to environmental factors and the passing of time. On the whole, our study population is a selected group that is not fully representative for the larger group of gender dysphoric people: they all fulfilled criteria for GID and were eligible for SRS. This perspective might certainly have an influence on the level of psychoneurotic distress. If there had been less certainty, at the end of the diagnostic phase and after initiation of hormonal treatment, about receiving SRS, results could have been different.

Future research challenges especially lie in comparing treated persons with GID with untreated patients. Additional questionnaires, including in-depth interviews, should investigate more thoroughly the specific effects of therapy on psychopathology and psychosocial state. Also, further exploration in patients seeking hormonal therapy without expressing desire for SRS is warranted, as we found initiation of hormonal therapy to be a major event in reducing psychopathology.

Conclusion

In conclusion, our findings confirm the hypothesis that sex reassignment therapy had a positive influence on co-occurring psychopathology if present in GID patients at presentation, by lowering the overall level of psychoneurotic distress. After treatment, our GID population showed a similar level of psychopathology compared with a general population, while they scored significantly higher at baseline. The most important effect seemed to result from the confirmation of the diagnosis and the initiation of hormone therapy, a finding that offers insights into a more individualized approach to persons suffering from GID.

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WHOQOL-100 Before and After Sex Reassignment Surgery in Brazilian Male-to-Female Transsexual Individuals

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ABSTRACT

Introduction: The 100-item World Health Organization Quality of Life Assessment (WHOQOL-100) evaluates quality of life as a subjective and multidimensional construct. Currently, particularly in Brazil, there are controversies concerning quality of life after sex reassignment surgery (SRS).

Aim: To assess the impact of surgical interventions on quality of life of 47 Brazilian male-to-female transsexual individuals using the WHOQOL-100.

Methods: This was a prospective cohort study using the WHOQOL-100 and sociodemographic questions for individuals diagnosed with gender identity disorder according to criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*. The protocol was used when a transsexual person entered the ambulatory clinic and at least 12 months after SRS.

Main Outcome Measures: Initially, improvement or worsening of quality of life was assessed using 6 domains and 24 facets. Subsequently, quality of life was assessed for individuals who underwent new surgical interventions and those who did not undergo these procedures 1 year after SRS.

Results: The participants showed significant improvement after SRS in domains II (psychological) and IV (social relationships) of the WHOQOL-100. In contrast, domains I (physical health) and III (level of independence) were significantly worse after SRS. Individuals who underwent additional surgery had a decrease in quality of life reflected in domains II and IV. During statistical analysis, all results were controlled for variations in demographic characteristics, without significant results.

Conclusion: The WHOQOL-100 is an important instrument to evaluate the quality of life of male-to-female transsexuals during different stages of treatment. SRS promotes the improvement of psychological aspects and social relationships. However, even 1 year after SRS, male-to-female transsexuals continue to report problems in physical health and difficulty in recovering their independence.

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Key Words: Quality of Life; Transsexuality; Transsexualism; Gender Dysphoria; Sex Reassignment Surgery

INTRODUCTION

Transsexual individuals often experience stigma and discrimination because they are a different gender than expected by the culture in which they live. This prejudice can affect almost every aspect of their lives, including physical security, psychological well-being, access to services, and basic human rights. Therefore, transsexual individuals often seek medical services to make their bodies more congruent with their gender identities.[1,2]

Since 1998, the Gender Identity Program (PROTIG) of the Hospital de Clínicas de Porto Alegre, Universidade Federal do Rio Grande do Sul (Porto Alegre, Brazil) has provided public assistance to transsexual individuals.[3] This program offers psychosocial support, medical assistance, and family guidance and refers patients for sex-reassignment surgery (SRS) when indicated. To undertake this surgery, individuals must undergo a multidisciplinary follow-up for at least 2 years, have a minimum age of 21 years (a federal requirement for this specific surgical procedure), have a positive psychiatric or psychological report,

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and be diagnosed with gender identity disorder (Mistério da Saúde, 2013).[4]

The World Health Organization (WHO)[5] defines quality of life (QOL) as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectation, standards and concerns." Based on this concept, the WHO developed an instrument to measure QOL, the 100-item WHO Quality of Life Assessment (WHOQOL-100). The WHOQOL-100 was previously validated for the Brazilian Portuguese by Fleck et al.[6,7] This instrument assesses six domains, namely physical health, psychological health, level of independence, social relationships, environment, and spirituality, religion, and personal beliefs. The WHOQOL-100 is widely used to evaluate the treatment response to many medical conditions.[8,9]

In a systematic review and meta-analysis of QOL and psychosocial outcomes in transsexual people,[10] researchers verified that sex reassignment with hormonal interventions more likely corrects gender dysphoria, psychological functioning and comorbidities, sexual function, and overall QOL compared with sex reassignment without hormonal interventions, although there is a low level of evidence for this.

Recently, Castellano et al[11] assessed QOL in 60 Italian transsexuals (46 transwomen and 14 transmen) at least 2 years after SRS using the WHOQOL-100 (general QOL score and quality of sexual life and quality of body image scores) to focus on the effects of hormonal therapy. Overall satisfaction improved after SRS, and QOL was similar to the controls. Bartolucci et al[12] evaluated the perception of quality of sexual life using four questions evaluating the sexual facet in individuals with gender dysphoria before SRS and the possible factors associated with this perception. The study showed that approximately half the subjects with gender dysphoria perceived their sexual life as "poor/dissatisfied" or "very poor/very dissatisfied" before SRS.

Nevertheless, there are no prospective studies about QOL using the WHOQOL-100 before and after SRS of male-to-female (MtF) transsexual persons. Accordingly, this study investigated the impact of surgical interventions on QOL for Brazilian MtF transsexual persons using the WHOQOL-100 at two time points, at entrance to the PROTIG (T1) and at least 1 year after SRS (T2).

METHODS

Participants

In this prospective cohort study, MtF transsexual persons were recruited from May 2000 through August 2006, and they were monitored after SRS. All patients underwent the classic penile inversion vaginoplasty, the surgical gold standard for MtF individuals, with an inverted penis skin flap used as the lining for the neovagina. All surgeries were performed by a single surgeon, with many years of experience in this technique.

The inclusion criteria were diagnosis of transsexualism (*International Classification of Diseases, Tenth Revision*) or gender identity disorder (*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision*) determined by the clinic mental health team and age older than 16 years. The *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* diagnostic criteria are no longer used; however, data collection was carried out from 2000 through 2006, when the criteria were applicable. Patients with axis I psychotic disorders, mental retardation, or substance addiction were excluded from the study. All patients signed an informed consent form for the study, which was approved by the research ethics committee (CEP HCPA number 98-319). All procedures involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

During this period, 190 patients were evaluated in the clinic. Of these, 160 completed the presurgery questionnaire, 48 underwent SRS, and 47 completed the questionnaire before and after SRS. All MtF transsexuals who underwent SRS and hormonal treatment during this period were selected for the study. Some who underwent SRS underwent additional procedures. These interventions were intended to repair functional or esthetic concerns and resolve complications of the original procedure. Among the most frequent new interventions were urethroplasty (nine patients, 19.14%) and vaginoplasty (six patients, 12.76%). The new vaginoplasty was performed using a suprapubic free skin graft. The urethroplasty was performed for urethral meatal stenosis. An individual who underwent SRS did not complete the questionnaire. Figure 1 shows the loss of participants who started the evaluation.

Procedures

The WHOQOL-100 questionnaire was administered to patients at T1 and at T2. For a minimum of 2 years, the transsexual individuals participated in supportive group therapy sessions for at least 1 hour, weekly or fortnightly. Demographic data, such as age, educational level, marital status, place of birth, and sexually transmitted infections (STIs), were obtained from the PROTIG database.

The Brazilian Portuguese version of the questionnaire was developed in the WHOQOL Center of the Psychiatry and Forensic Medicine Department at the Universidade Federal do Rio Grande do Sul by Fleck et al.[6,7]

The WHOQOL-100 questionnaire, a self-administered questionnaire, is divided into 6 domains and 24 facets:

Domain I—physical health: 1 = pain and discomfort; 2 = energy and fatigue; 3 = sleep and rest

Domain II—psychological: 4 = positive feelings; 5 = thinking, learning, memory, and concentration; 6 = self-esteem; 7 = bodily image and appearance; 8 = negative feelings

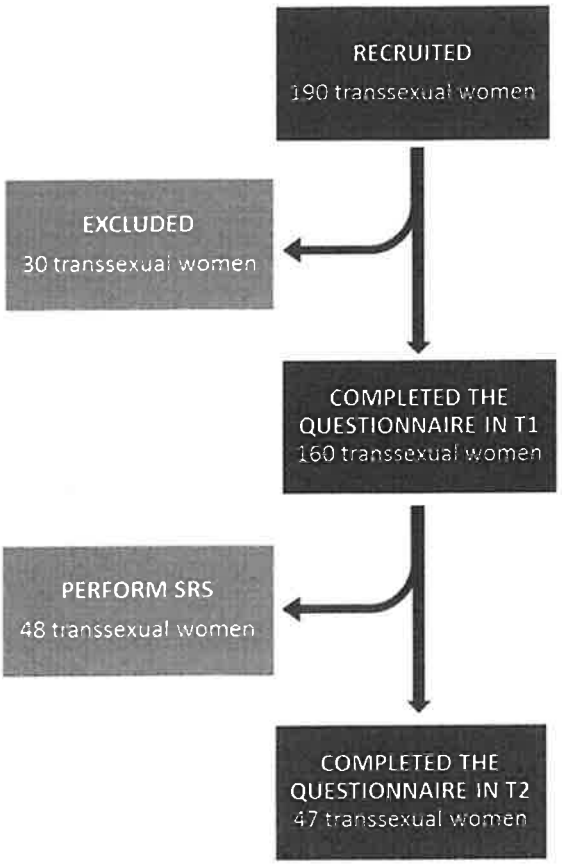

Figure 1. Participants in study. SRS = sex-reassignment surgery; T1 = when a transsexual person entered the ambulatory clinic; T2 = at least 12 months after sex-reassignment surgery. Figure 1 is available in color online at www.jsm.jsexmed.org.

Domain III—level of independence: 9 = mobility; 10 = activities of daily living; 11 = dependence on medical substances or medical aids; 12 = work capacity

Domain IV—social relationships: 13 = personal relationships; 14 = social support; 15 = sexual activity

Domain V—environment: 16 = physical safety and security; 17 = home environment; 18 = financial resources; 19 = health and social care: accessibility and quality; 20 = opportunities for acquiring new information and skills; 21 = participation in and opportunities for recreation and leisure; 22 = physical environment (pollution, noise, traffic, and climate); 23 = transport

Domain VI—spirituality, religion, and personal beliefs: 24 = religion, spirituality, and personal beliefs

The responses are analyzed using a Likert scale (1 to 5, with a higher score indicating a better QOL).

Statistical Analyses

Statistical analyses were performed using SPSS 18.0 (SPSS, Inc, Chicago, IL, USA). The Kolmogorov-Smirnov test was used to assess the distribution of variables (normal distribution) and descriptive and frequency statistics (mean and SD). The Student t-test was used to compare the paired samples at T1 and T2 (domains and facets). In the second phase, the Student t-test was used to calculate QOL for the group that underwent new surgical interventions and the group that did not during the year after SRS. For statistical analysis, all results were controlled for variations in demographic characteristics. The significance level for this analysis was set at 5% ($P < .05$).

RESULTS

The sample was comprised of 47 MtF transsexual individuals whose mean age was 31.23 years when they entered the PROTIG (SD = 9.82 years; median age = 31 years; age range = 16–54 years). Forty-two patients (89.4%) were single, whereas 5 (10.6%) were in stable relationships. For educational level, 5 (10.6%) had received less than 8 years of formal education, and 12 (25.5%) had completed 8 years of formal education. Twenty-three patients (48.9%) completed more than 8 years of formal education, and 7 (14.9%) attended a university. Twenty-four patients (51%) resided in Porto Alegre and the metropolitan region, whereas 20 (42.6%) were from the Rio Grande do Sul countryside and 3 (6.4%) were from other states. For STIs, seven (14.9%) were HIV positive, and five (10.6%) were positive for venereal disease. Age, educational level, marital status, place of birth, STI, and hormonal therapy were not significantly associated with the results of the WHOQOL-100 domains (Table 1).

Domains II (psychological) and IV (social relationships) were improved significantly after SRS. In contrast, domains I (physical health) and III (level of independence) were significantly worse after SRS. Domains for the environment and spirituality, religion, and personal beliefs domains did not change after SRS (Table 2).

When considering the facets, sexual activity, freedom, physical safety and security, financial resources, and health and social care were improved after SRS, whereas energy and fatigue, sleep and rest, negative feelings, mobility, activities of daily living, and physical environment worsened (Table 3).

For the surgical procedures, only 16 (34.04%) did not undergo new interventions 1 year after SRS (Table 4). Individuals who underwent surgical procedures during the 1-year follow up period after SRS showed worsening in domains II (psychological) and IV (social relationships; Table 5).

DISCUSSION

To our knowledge, this is the first cohort study in transsexual individuals using the WHOQOL-100 to compare patients before and after SRS. Our results are consistent with those of other studies showing that SRS improves QOL for these individuals.[10-21] Two domains showed changes in patients' QOL, specifically domains II (psychological: positive feelings, thinking, learning, memory and concentration, self-esteem, bodily image

Table 1. Sociodemographic characteristics

Variables	N*	Mean or % (SD)
Age (y)	47	31.23 (9.82)
Age when hormone therapy began (y)	47	19.16 (5.80)
Schooling (y)		
<8	47	5 (10.6)
8	47	12 (25.5)
>8	47	23 (48.9)
University	47	7 (14.9)
Marital status		
Single	47	42 (89.4)
Stable relationship	47	5 (10.6)
Place of birth		
Porto Alegre	47	19 (40.4)
Metropolitan area	47	5 (10.6)
State countryside	47	20 (42.6)
Other states	47	3 (6.4)
STIs		
HIV positive	47	7 (14.9)
VDRL positive	47	5 (10.6)

STIs = sexually transmitted infections; VDRL = Venereal Disease Research Laboratory test.
*Total sample.

and appearance, and negative feelings) and IV (social relationships: personal relationships, social support, and sexual activity). These results showed significant improvement in the ability to develop relationships, greater professional acceptance, and, for this reason, a greater sense of being part of a society, whereas previously they felt like outsiders.

In studies reviewing the transsexual population, only part of the WHOQOL-100 was applied to the phases before[12] or after[11] SRS. Surveys that evaluated QOL for transsexuals through other questionnaires also showed improvements in psychological and social aspects after SRS.[13-21] Wierckx et al[13] published a self-report on physical and mental health (Dutch version of the Short Form-36

Table 2. WHOQOL-100 questionnaire results comparing T1 and T2

	Transsexual sample (N = 47)	
WHOQOL-100 domain	Mean (SD)	*P* value
Domain I—physical health	1.23 (2.61)	.002*
Domain II—psychological domain	−0.75 (2.44)	.041*
Domain III—level of independence	0.82 (2.52)	.031*
Domain IV—social relationships	−1.16 (2.79)	.007*
Domain V—environment	−0.30 (1.51)	.178
Domain VI—spirituality, religion, personal beliefs	−0.20 (2.25)	.547

T1 = when a transsexual person entered the ambulatory clinic; T2 = at least 12 months after sex-reassignment surgery; WHOQOL-100 = 100-item World Health Organization Quality of Life Assessment.
*Statistically significant by Student t-test for paired samples (T1 and T2), with 95% CI of the difference.

Table 3. Facet results at T1 and T2

	Transsexual sample (N = 47)			
Facets for T1 and T2	Mean	SD	t Value*	*P* value
Facet 1—pain and discomfort	−0.33	3.63	−0.62	.541
Facet 2—energy and fatigue	1.81	3.42	3.63	.001†
Facet 3—sleep and rest	1.55	4.37	2.44	.019†
Facet 4—positive feelings	−0.23	2.37	−.68	.502
Facet 5—thinking, learning, memory and concentration	−0.40	3.22	−.860	.394
Facet 6—self-esteem	−0.66	2.43	−1.87	.069
Facet 7—bodily image and appearance	−1.34	4.78	−1.92	.061
Facet 8—negative feelings	1.11	3.67	2.07	.045†
Facet 9—mobility	1.30	4.37	2.04	.048†
Facet 10—activities of daily living	1.19	3.54	2.30	.026†
Facet 11—dependence on medical substances and medical aids	−0.74	3.19	−1.60	.117
Facet 12—work capacity	0.04	3.18	0.09	.927
Facet 13—personal relationships	0.02	2.67	0.056	.957
Facet 14—social support	0.30	2.99	0.68	.498
Facet 15—sexual activity	−3.80	4.92	−5.29	.000†
Facet 16—freedom, physical safety and security	−1.32	2.77	−3.27	.002†
Facet 17—home environment	0.43	2.69	1.08	.284
Facet 18—financial resources	−1.15	2.99	−2.63	.012†
Facet 19—health and social care: accessibility and quality	−1.02	2.56	−2.74	.009†
Facet 20—opportunities for acquiring new information and skills	−0.39	2.99	−0.89	.377
Facet 21—participation in and opportunities for recreation/leisure	−0.70	2.49	−1.93	.060
Facet 22—physical environment	1.32	2.55	3.55	.001†
Facet 23—transport	0.42553	3.33	0.877	.385
Facet 24—religion, spirituality, personal beliefs	−0.20	2,25	−0.606	.547

T1 = when a transsexual person entered the ambulatory clinic; T2 = at least 12 months after sex-reassignment surgery.
*Student t-test value.
†Statistically significant by Student t-test for paired samples (T1 and T2), with 0.05 CI of the difference.

Question Health Survey version 2) using data on QOL and sexual health 8 years after SRS and testosterone treatment in 49 transsexual men. Most participants had an increase in the frequency of masturbation, sexual arousal, and ability to achieve orgasm. Surgical satisfaction was high, despite a relatively high complication rate.

Kuhn et al[14] evaluated QOL and patient satisfaction in 52 MtF and 3 female-to-male transsexual persons 15 years after SRS compared with healthy controls using King's Health

Table 4. Percentage of individuals who underwent intervention after SRS

Procedure	Transsexual sample (n = 46), n (%)
Only SRS	16 (34.8)
Intervention after SRS	30 (65.2)

SRS = sex-reassignment surgery.

Questionnaire. The study showed that QOL was similar to controls except for the domains of general health, role limitation, and physical and personal limitation.

Psychological, social, and occupational factors were analyzed in 62 Dutch transsexual persons (35 MtF and 27 female-to-male transsexuals) after SRS. After SRS, fewer patients attempted suicide, but that percentage remained higher than the average of the general population. The two groups reported that their social life improved after SRS. This study showed positive psychological and social outcomes associated with SRS, with no difference between MtF and female-to-male patients. However, despite positive results, most of these patients remained fragile because the percentage of suicide attempts was high and they had a hard time finding work.[15]

In contrast to those results, domains I (physical health: pain and discomfort, energy and fatigue, and sleep and rest) and III (level of independence: mobility, activities of daily living, dependence on medical substances or medical aids, and work capacity) were significantly worsened after SRS. These negative results are easily justified by the recovery that all patients underwent during the first year after SRS. The surgical procedure is complex and involves the possibility of surgical complications and other esthetic procedures. Consistent with this, individuals who underwent new medical interventions during the 1-year period showed significant worsening of domains II (psychological) and IV (social relations) compared with individuals who did not undergo new procedures (Tables 4 and 5).

When analyzing the facets separately before and after SRS, sexual activity, freedom, physical safety and security, financial resources, and health and social care were improved. Accessibility and quality also were improved after SRS, whereas energy and fatigue, sleep and rest, negative feelings, mobility, activities of daily living, and physical environment worsened. Demographic variables (age, educational level, marital status, place of birth, and STI) did not influence QOL before and after SRS.

One special point of interest in this study is sexual activity; it improved after SRS. One explanation for this finding could be related to the sense of personal fulfillment with surgery and better acceptance of the body. Bartolucci et al[12] stated that SRS is considered the mainstay for subjects with gender dysphoria, not only to resolve their gender dysphoria but also to achieve an improvement in sexual satisfaction.

Therefore, the WHOQOL-100 is an important instrument to evaluate QOL for transsexual individuals during the different stages of treatment. The use of other instruments to evaluate QOL or even the adaptation of this instrument for this group of patients, as previously used for other specific populations (the elderly and patients with HIV), could confirm its usefulness to assess this population.

There are several limitations of this study, including the evaluation period, which was 1 year after SRS, the postoperative recovery time of the patients, and different levels of QOL among individuals; therefore, we emphasize the need for additional follow-up trials to assess satisfaction with SRS.

CONCLUSION

This is the first study that to evaluate the result of surgical interventions in transsexual individuals in Brazil. In addition, it advances the still small literature that used the full WHOQOL-100 before and after SRS. The WHOQOL-100 is an important instrument to evaluate QOL in Brazilian MtF individuals during the different stages of treatment. Using the WHOQOL-100, we found that SRS promotes the improvement of psychological aspects and social relations. However, even 1 year after SRS, MtF

Table 5. Individuals who underwent intervention after sex-reassignment surgery in relation to WHOQOL-100 domains

	Transsexual sample (n = 46)								
	Levene test		t-Test						
								95% CI of difference	
Domains	F	Significance	t value	df	Significance (2-tailed)	Mean difference	SE of difference	Lower	Upper
I	1.47	0.23	1.700	44	0.09	0.98	0.57	−0.18	2.14
II	3.68	0.06	2.625	44	0.01*	10.66	0.63	0.38	2.94
III	1.56	0.21	1.409	44	0.16	0.95	0.67	−0.40	2.31
IV	0.66	0.41	2.059	44	0.04*	10.45	0.70	0.03	2.87
V	2.19	0.14	1.978	44	0.05	0.98	0.49	−0.018	1.99
VI	0.00	0.98	−0.920	44	0.36	−0.70	0.77	−2.26	0.84

SE = standard error; WHOQOL-100 = 100-item World Health Organization Quality of Life Assessment.
*Statistically significant by Student t-test for paired samples (when a transsexual person entered the ambulatory clinic and ≥12 months after sex-reassignment surgery), with 0.05 CI of the difference.

persons continue to report problems in physical health and difficulty in recovering their independence.

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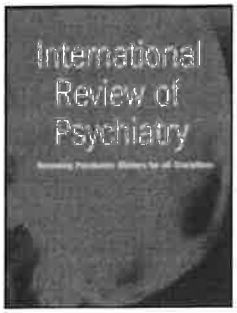

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REVIEW ARTICLE

Mental health and gender dysphoria: A review of the literature

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ABSTRACT

Studies investigating the prevalence of psychiatric disorders among trans individuals have identified elevated rates of psychopathology. Research has also provided conflicting psychiatric outcomes following gender-confirming medical interventions. This review identifies 38 cross-sectional and longitudinal studies describing prevalence rates of psychiatric disorders and psychiatric outcomes, pre- and post-gender-confirming medical interventions, for people with gender dysphoria. It indicates that, although the levels of psychopathology and psychiatric disorders in trans people attending services at the time of assessment are higher than in the cis population, they do improve following gender-confirming medical intervention, in many cases reaching normative values. The main Axis I psychiatric disorders were found to be depression and anxiety disorder. Other major psychiatric disorders, such as schizophrenia and bipolar disorder, were rare and were no more prevalent than in the general population. There was conflicting evidence regarding gender differences: some studies found higher psychopathology in trans women, while others found no differences between gender groups. Although many studies were methodologically weak, and included people at different stages of transition within the same cohort of patients, overall this review indicates that trans people attending transgender health-care services appear to have a higher risk of psychiatric morbidity (that improves following treatment), and thus confirms the vulnerability of this population.

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Gender dysphoria; transsexualism; mental health; psychiatric disorders; depression; anxiety

Introduction

The Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People, version 7 (SOC-7) by the World Professional Association for Transgender Health (WPATH), provides clinical guidance in 'how to assist transsexual, transgender, and gender nonconforming people with safe and effective pathways to achieving lasting personal comfort with their gendered selves, in order to maximize their overall health, psychological well-being, and self-fulfilment. This assistance may include primary care, gynaecological and urological care, reproductive options, voice and communication therapy, mental health services (e.g. assessment, counselling, psychotherapy), and hormonal and surgical treatments' (Coleman et al., 2012). SOC-7 argues that the mental health professional should work within a multi-disciplinary team or in close contact with other gender specialists. The main roles of mental health professionals within gender care have been described as:

1. To facilitate the diagnosis of gender dysphoria
2. To assess for psychiatric co-morbidity
3. To explore the readiness for gender-confirming medical intervention (Coleman et al., 2012).
4. To support the trans person through the health pathway (Lev, 2009).

Although some professionals in the field have described the involvement of a mental health professional in the care of trans people as a responsible form of care (Selvaggi & Giordano, 2014), it could be argued that this is the direct result of transsexualism or gender dysphoria being considered a psychiatric diagnosis. The placement of the diagnoses (either gender dysphoria or transsexualism) within the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) (American Psychiatric Association, 2013), and within the Mental and Behavioural Disorders chapter of the *International Classification of Diseases and Health Related Problems* (World Health Organization, 1992), has been subject to continuing debate. The first appearance of these diagnoses in the aforementioned publications (using different

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terms) may be related to the social and medical attitudes at the time when Harry Benjamin started to describe and treat trans people (Drescher et al., 2012). Whether incongruence with one's gender is a natural variation or a pathology, and how this view may influence discrimination, stigma and access to medical treatment, is well discussed in a paper by Meyer-Bahlburg (2010).

The WHO's proposal for the next edition of the ICD (ICD-11) is to replace the current diagnostic term 'transsexualism' with 'gender incongruence', and to move this diagnosis from chapter 5 to a new chapter entitled 'Conditions related to sexual health' (Drescher et al., 2012). This will support the view of many that a diagnosis describing trans people should not be part of a psychiatric category (Richards et al., 2015). This could help to remove some of the stigma which trans people currently encounter. However, by doing so, it also raises questions concerning the future role, if any, of mental health professionals in transgender care.

One of the roles may be connected to the high prevalence of psychiatric morbidity among trans people described in the literature (Gomez-Gil et al., 2009; Hepp et al., 2005; Heylens et al., 2014a; Mazaheri Meybodi et al., 2014a), which may require assessment and management by a mental health professional. The literature in this area is confusing, as different prevalence rates of psychiatric co-morbidity have been described.

With this in mind, this paper has two aims:

1. To review the available literature that looks at the prevalence of psychiatric disorders and psychopathology among trans people
2. To review the available literature describing the psychiatric outcome following gender-confirming medical interventions (GCMI), either cross-sex hormone treatment (CHT) and/or gender-confirming genital surgery (GCGS)

As the terminology in this field has changed over the years, the term 'trans people' will be used in this review to refer to individuals with gender dysphoria attending transgender health-care services and, in most cases, seeking gender-confirming medical interventions.

Methodology

Eligibility criteria

Studies were selected only if participants were diagnosed by health professionals, and/or had been accepted for gender-confirming interventions, and had empirical data relating to the prevalence of psychiatric morbidity or psychopathology pre- or post-treatment. Articles dealing exclusively with self-harm (non-suicidal self-injury), suicidality, autism, eating disorders or individuals under 18 years old were not included, as they are part of other reviews within this special edition. Only studies in English and with more than 10 participants were selected.

Information sources and search

An electronic literature search was conducted between January 2000 and April 2015 using PubMed. Articles in the *International Journal of Transgenderism* (not in PubMed) were also included, in order to identify more studies. Additionally, reference sections of identified articles were also examined for further relevant publications. The search used the following words in the title and/or abstract.

1. For terms referring to trans people: *transsexualism, transsexual, transgender, gender dysphoria, gender identity disorder, trans**
2. For psychiatric disorders and psychopathology: *mental health, psychopathology, psychiatric, depression, anxiety*

Every term used for trans people was combined using the 'or' and the 'and' operator with every term used for psychiatric disorders and psychopathology.

Study selection

A total of 647 studies were identified. By the screening of titles and abstracts, 47 studies fulfilled the eligibility criteria and were selected for more in-depth analysis. Out of these 47 studies, nine were excluded because they did not provide data regarding psychiatric disorders or psychopathology, but focused primarily on quality of life or sexual health, thus a total of 38 studies were selected for this review. Data extraction was performed using a standardized table with the following categories: title, authors, date of publication, participants, age at assessment, study design, diagnostic criteria used, control group, measurements related to psychiatric disorder and/or psychopathology, prevalence rates of psychiatric disorders, and conclusions of the study. For those papers investigating outcome, information regarding follow-up was also included, as well as the outcome on psychopathology and/or psychiatric disorders. The data is summarized in two tables: Table 1 shows cross-sectional studies describing prevalence rates of psychiatric disorders and/or psychopathology in trans people (27 studies). This table includes trans people at different stages of treatment. Table 2 shows longitudinal studies describing psychiatric outcome of post gender-confirming medical interventions (11 studies).

Table 1. Cross-sectional studies investigating psychiatric disorders and psychopathology in trans people.

Authors (year) Country	Number of trans participants/ diagnosis/ mean age at assessment	Treatment status: (on CHT or post-GCGS)	Study design	Comparative groups	Outcome measure	Prevalence in trans	Conclusion
Haraldsen & Dahl (2000) Norway	35 FtM 51 MtF DSM-III-R DSM-IV 34.0 years FtM 33.3 years MtF	CHT NR GCGS Mixed pre- and post-surgery	Single centre (Gender clinic) Cross-sectional	CC 1068 Personality disorder (PD) 101	SCID-I SCID-II GAF SCL-90R	Axis 1 disorders (mostly depression and anxiety) 32.5% Axis 2 disorders 19.8% SCL-90R as per CC	Groups: Trans lower scores in SCL-90R than PD Gender: MtF lower SCL-90R compared to FtM
Miach et al. (2000) Australia	82 MtF: 48 GID 34 GIDAANT DSM-III-R 33.5 years	CHT NR GCGS 0%	Single centre (Gender clinic) Cross-sectional	GID vs GIDAANT	MMPI-2	Psycho-pathology: Low in 85% of GID High in 47% of GIDAANT	GID differs significantly in degree of psycho-pathology from GIDAANT
Kersting et al. (2003) Germany	12 FtM 29 MtF DSM-IV 34.7 years	CHT NR GCGS 17%	Single centre (Gender clinic) Cross-sectional	Psychiatric inpatients 115 Normative data	DES SCID-D	Dissociative symptoms: Trans similar to psychiatric inpatients	DES and SCID-D limited validity in trans people
Hepp et al. (2005) Switzerland	11 FtM 20 MtF DSM-IV 33.2 years	CHT 32% GCGS 23%	Single centre (Gender clinic) Cross-sectional	No	SCID-I, -II HADS	Axis I disorder current (mostly anxiety) 38.7% Axis I disorder, lifetime (mostly mood disorder and substance abuse) 71% Axis II disorder 41.9%	Gender, age, treatment status: No differences
Kim et al. (2006) Korea	43 MtF DSM-IV 20.4 years	CHT 88% GCGS 26%	Single centre (Identified as part of the military service examination with gender dysphoria) Cross-sectional	Cis men 47 Matched for age and education	BDI SADS SES	BDI (mean) 21.4 SADS (mean) 13.6 SES (mean) 16.5	Trans significantly higher scores on depression and social anxiety, and lower scores on self-esteem than controls
Gomez-Gil et al. (2008)[a] Spain	56 FtM 107 MtF DSM-IV 27.3 years FtM 29.9 years MtF	CHT NR GCGS 0%	Single centre (Gender clinic) Cross-sectional	Normative data	MMPI-2	MMPI: Within normal range	Gender: MtF not on CHT scored higher than on CHT FtM no difference regarding CHT status Limitation: Pre-/post groups not the same
Gomez-Gil et al. (2009)[a] Spain	159 MtF 71 FtM DSM-IV-TR ICD-10 27.3 years FtM 29.7 years MtF	CHT 49% GCGS 0%	Single centre (Gender clinic) Cross-sectional	No	MINI	Psychiatric disorders Life time: Mood and adjustment disorders 56% (MtF) and 70.4% (FtM) Non-alcohol substance abuse/ dependence 30.2% (MtF) Generalized anxiety disorder 8.8% (MtF) and 5.6% (FtM) Current: Social phobia 8.2% (MtF) and 11.3% (FtM)	Adjustment disorders and substance abuse more frequent in MtF vs FtM

(continued)

Table 1. Continued

Authors (year) Country	Number of trans participants/ diagnosis/ mean age at assessment	Treatment status: (on CHT or post-GCGS)	Study design	Comparative groups	Outcome measure	Prevalence in trans	Conclusion
Madeddu et al. (2009) Italy	34 MtF 16 FtM DSM-IV-TR 31.7 years	CHT 36% GCGS 0%	Single centre (Gender clinic) Cross-sectional	No	SCID-II	Axis II disorders 52% Most frequent PD Narcissistic	No Axis II differences between genders
Weyers et al. (2009) Belgium	50 MtF ICD-10 43.06 years	CHT 100% GCGS 100%	Single centre (Gender clinic) Cross-sectional	Normative data	SF-36	Mental health problems: No difference to normative data	Less Psychopathology if in a relationship
Hoshiai et al. (2010) Japan	349 FtM 230 MtF DSM-IV 26.5 years FtM 32.0 years MtF	CHT 32% GCGS 12%	Single centre (Gender clinic) Cross-sectional	No	Clinical interview and clinical records	Axis I disorder 13.6% Adjustment disorder 6.7% Anxiety disorder 3.6% Mood disorder 1.4%	MtF more Axis I disorders compared to FtM
Bandini et al. (2011)[b] Italy	109 MtF DSM-IV-TR 36.0 years	CHT 70.6% GCGS 25.7%	Single centre (Gender clinics) Cross-sectional	Trans with and without childhood maltreatment (CM)	Psychiatric interview SCL-90R	Psychiatric disorder (life time): 66.7% (CM) 37.2% (non-CM) SCL-90R: no difference between groups	CM group higher body dissatisfaction and worse life time mental health
Dhejne et al. (2011) Sweden	191 MtF 133 FtM ICD-8,-9,-10 33.3 years FtM 36.3 years MtF	CHT NR GCGS 100%	Multi centre (National register) Cross-sectional	CC 3240 matched for age, natal and new assigned gender	Death (including suicide) Psychiatric morbidity and abuse	When compared to 1973-2003 controls: Mortality 2.8 HRadj Any psychiatry diagnoses: 2.8 HRadj Suicide attempts: 4.9 HRadj When compared 1989-2003 to controls: Mortality the same. Any psychiatry diagnoses: 2.8 HRadj Suicide attempts: the same	Gender: no difference, natal or assigned gender Female or male control group: No difference
Simon et al. (2011) Hungary	30 MtF 17 FtM DSM-IV 28.0 years FtM 26.0 years MtF	CHT NR GCGS 0%	Single centre (Gender clinic) Cross-sectional	CC= 157	SCL-90R	Psychopathology: SCL-90R: No differences compared to controls	MtF elevated levels of interpersonal sensitivity
Gomez-Gil et al. (2012)[a] Spain	74 FtM 113 MtF ICD-10 DSM-IV-TR 29.7 years	CHT 35.8% GCGS 42.2%	Single centre (Gender clinic) Cross-sectional	Trans with and without treatment Normative data	SADS HAD-A HAD-D	Social anxiety, depression and anxiety: SADS, HADS scores normal range except for HAD-A Differences CHT or not: CHT group lower scores	Gender: No difference CHT: CHT group better when compared to not treated Limitation: Pre-/post groups were not the same
Gorin-Lazard et al. (2012)[c] France	30 FtM 31 MtF DSM-IV-TR 29.9 years FtM 39.4 years MtF	CHT 72.1% GCGS NR	Multi centre (Gender clinic) Cross-sectional	No	BDI	Depression: 25% significant scores in the BDI	Gender: no difference
Auer et al. (2013) Germany	32 FtM 57 MtF ICD-10	CHT 100% GCGS 65%	Single centre (Endocrinology clinic) Cross-sectional	CC 336 age and sex (natal and phenotype) matched	SCL-90R	Psychopathology: SCL-90R worse scores on all scales compared controls	Gender: Depressive symptoms higher in MtF FtM have profile as cis men MtF more similar to cis women

(continued)

Table 1. Continued

Authors (year) Country	Number of trans participants/ diagnosis/ mean age at assessment	Treatment status: (on CHT or post-GCGS)	Study design	Comparative groups	Outcome measure	Prevalence in trans	Conclusion
	32.3 years FtM 47.9 years MtF						
Fisher et al. (2013)[b] Italy	92 MtF 48 FtM DSM-IV-TR 32.6 years	CHT 69.8% GCGS 22.1%	Single centre (Gender clinic) Cross-sectional	No	SCID-I-II SCL-90R	Axis I disorders 18.7% Mood and adjustment disorder 10.8% Anxiety disorder 5% Axis II disorders 4.3%	Gender: no difference
Gorin-Lazard et al. (2013)[c] France	31FtM 36 MtF DSM-IV-TR 35.1 years	CHT 73.1% GCGS NR	Multi-centre (Gender clinics) Cross-sectional	Trans with and without CHT	BDI SSEI	Depression and self-esteem: Trans on CHT less depressive symptoms, better self esteem	NA Limitation: Pre-/post groups were not the same
Davey et al. (2014) UK	63 MtF 40 FtM ICD-10 45.7 years	CHT 78.6% GCGS 16.5%	Single centre (Gender clinic) Cross-sectional	CC 103 Controlled by age	SCL-90R	Psychopathology: SCL-90R scores higher in trans	Social support did not significantly predict psychopathology
Duisin et al. (2014) Serbia	21 MtF 9 FtM DSM-IV-TR 30.4 years	CHT NR GCGS 0%	Single centre (Gender clinic) Cross-sectional	CC 30	SCID-II	Axis-II diagnosis 66.6% (most frequent paranoid and avoidant)	Difference: GID group more Axis-II disorders compared to CC group Gender: MtF more psychopathology compared to FtM
Fisher et al. (2014)[b] Italy	59 FtM 66 MtF DSM-IV-TR 28.7 years FtM 33.1 years MtF	CHT 0% GCGS NR	Multi-centre (Gender clinics) Cross-sectional	Trans with and without CHT	SCL-90R BUT GSI	Psychopathology: No difference between both on SCL-90R BUT GSI: MtF with CHT group had less body uneasiness than not treated group	Body uneasiness effectively diminished with CHT Limitation: Pre-/post groups were not the same
Judge et al. (2014) Ireland	159 MtF 59 FtM DSM-IV-TR 32.6 years	CHT 20.2% GCGS 1.6%	Single centre (Gender clinic) Cross-sectional	No	Psychiatric assessment by mental health professional	Depression (lifetime) 34.4% Schizophrenia 3.67% Bipolar disorder 2.29%	High prevalence of psychiatric conditions Limitation: No controls
Heylens et al. (2014a) Belgium Germany Netherlands Norway	182 MtF 123 FtM DSM-IV-TR 22.8-31.2 years FtM 21.6-36.5 years MtF (Depends on country)	CHT 0% GCGS 0%	Multicentre 4 countries Cross-sectional	No	MINI SCID-II	Axis I diagnosis (current) 38% Affective problems 27% Anxiety problems 17% Axis I (current and lifetime) 70% Affective problems 60% Anxiety problems 28% Axis II diagnosis 15%	Gender, age of onset: No differences
Mazaheri Meybodi et al. (2014a) Iran	47 MtF 36 FtM DSM-IV-TR Age: NR	CHT 92.9% GCGS 0%	Single centre (Gender clinic) Cross-sectional	No	SCID-I	Axis-I diagnosis 62.7% Major depressive disorder (33.7%) Specific phobia (20.5%) Adjustment disorder (15.7%)	High prevalence of Axis I diagnosis Limitation: No controls
Mazaheri Meybodi et al. (2014b) Iran	39 MtF 31 FtM DSM-IV-TR Age: NR	CHT 92.9% GCGS 0%	Single centre (Gender clinic) Cross-sectional	No	MCMI-II	Axis II diagnosis 81.4% (57.1% narcissistic)	High prevalence of Axis II diagnosis Limitation: No controls
Claes et al. (2015) UK	103 MtF 52 FtM	CHT 0% GCGS 0%		No	SCL-90R RSE	Psychopathology: MtF reported significantly higher scores	

(continued)

Table 1. Continued

Authors (year) Country	Number of trans participants/ diagnosis/ mean age at assessment	Treatment status: (on CHT or post-GCGS)	Study design	Comparative groups	Outcome measure	Prevalence in trans	Conclusion
	ICD-10 34.5 years		Single centre (Gender clinic) Cross-sectional			on paranoid ideation, interpersonal distrust, anxiety, depression and obsessive-compulsive complaints compared with FtM	Gender: MtF significantly lower level of self-esteem compared to FtM
Colizzi et al. (2015) Italy	85 MtF 33 FtM DSM-IV-TR 30.2 years	CHT 0% GCGS 0%	Single centre (Gender clinic) Cross-sectional	No	DDIS DES	Dissociative disorders 29.6%	Gender: No differences

BDI, Beck depression inventory; BUT-GSI, Body Uneasiness Test Global Severity Index (the total score of BUT); CC, Cis controls; CHT, = cross-sex hormonal treatment; DES, Dissociative Experience Scale; DDIS, Dissociative Disorders Interview Schedule; FtM, female-to-male subjects, trans men; GAF, Global Assessment of Functioning Scale; GCGS, gender confirmation genital surgery; GD, Gender dysphoria; GID, gender identity disorder; -GIDAANT, gender identity disorder of adolescence and adulthood, non-transsexual type; GSI, Global Severity Index; HADS, Hospital Anxiety and Depression Scale; HAD-A, HAD-Anxiety subscale to HADS; HAD-D, HAD-Depression sub scale to HADS; HRadj, adjusted hazard ratio; MINI, Mini International Neuropsychiatric Interview; MMPI-2, Minnesota Multiphasic Personality Inventory, second version; MCMI-II, Millon Clinical Multiaxial Inventory, second version; MtF, male to female subjects, trans women; NR, not reported; RSE, Rosenberg Self-Esteem scale; SADS, Social Avoidance and Distress Scale; SCID-I and II, Structured Clinical Interview for DSM-IV, Axis I and II disorders; SCID-D, Structured Clinical Interview for DSM-IV-Dissociative Disorders; SCL-90R, Symptom Checklist-90 (revised); SES, Self-Esteem Scale; SF-36, Short Form 36-item Questionnaire; SSEI, Social Self -Esteem Inventory.

[a,b,5]Studies using the same data.

Description of studies

Cross-sectional studies

The 27 studies were all conducted in different transgender health-care services or gender identity clinic services, using data collected as part of the assessment (whether prospectively or retrospectively). The diagnosis was made according to DSM criteria (ranging from DSM-III-R to DSM-5) (American Psychiatric Association, 1987, 1994, 2000, 2013) and, in six studies, according to the ICD-10 (World Health Organization, 1992). Only three studies described psychiatric co-morbidity and/or psychopathology in patients exclusively without any form of treatment for gender dysphoria (Claes et al., 2015; Colizzi et al., 2015; Heylens et al., 2014a). The remainder of the studies included people at different stages of treatment, or the treatment status was unknown or not reported. Only five studies were multi-centred and, with the exception of one (Kim et al., 2006), participants were all recruited through transgender health-care services.

The studies concluded that the prevalence of psychiatric co-morbidity and psychopathology was high. However, only seven studies used a control group, and only four of them matched the cis controls with the trans population studied for factors known to affect psychopathology (such as age). Most studies used normative data to reach a conclusion as to whether the prevalence found was high or not. The most commonly used measurement to assess for psychiatric disorders was the Structured Clinical Interview for DSM (SCID) (First et al., 2002), and for psychopathology, the Symptom Checklist -90 (SCL-90) (Derogatis et al., 2010). For more details, please see Table 1.

Longitudinal studies

The 11 longitudinal studies evaluate changes in psychiatric disorders and/or psychopathology following gender-confirming medical interventions. Three studies assess the patients following cross-sex hormones, six following gender-confirming genital surgery, and two studies following both treatments. Six of the studies also provide cross-sectional data pretreatment compared with normative values. The information regarding follow-up time was recorded in all of the studies and ranged from six months (Udeze et al., 2008) to 13.3 years (Ruppin & Pfäfflin, 2015). Lost to follow-up ranged from 0% (Colizzi et al., 2013, 2014) to 49.3% (Ruppin & Pfäfflin, 2015). For more information about these studies, see Table 2.

Table 2. Follow up studies investigating outcome of psychiatric disorders and psychopathology post gender treatment in trans people.

Authors (year) Country	Number of trans participants/ diagnosis/ mean age at assessment	Treatment status: (on CHT or post GCGS)	Study design	Comparative groups	Length of follow-up post-treatment	Lost to follow-up	Outcome measure	Results
Slabbekoorn et al. (2001) Netherlands	47 FtM 54 MtF DSM-III-R 25.7 years FtM 32.9 years MtF	CHT 100% GCGS 0%	Single centre (Gender Clinic) Prospective	Pre- vs post-CHT	14 weeks post-CHT	0	AIM SAQ	Differences pre-/post-treatment: MtF: positive emotions increased after CHT FtM less intensity for both negative and positive emotions after CHT
Smith et al. (2001) Netherlands	13 FtM 7 MtF DSM-III-R 16.6 years	CHT 100% GCGS 100%	Single centre (Gender clinic) Prospective	Pre- vs post-GCGS Control: 21 patients who have been denied/ declined GCGS	1–4 years post-GCGS 1–7 years controls	17%	Dutch Short MMPI SCL-90	Differences pre-/post-treatment: Treated group no longer gender dysphoric, psychologically and socially functioning well. Neither group showed significant differences between pre- and post-GCGS on SCL-90
Smith et al. (2005) Netherlands	71 FtM 117MtF DSM-IV 29.6y FtM 38.6y MtF	CHT 100% GCGS 100%	Single centre (Gender clinic) Prospective	Pre- vs post-GCGS Normative	1–4 years post-GCGS	16%	UGDS Dutch Short MMPI SCL-90	Cross-sectional pretreatment: As normative data Differences pre-/post-treatment: Fewer psychological problems post-treatment. Gender dysphoria absence post-treatment Predictors: FtM psychological better outcome than MtF Heterosexual as per natal sex worse outcome
De Cuypere et al. (2006) Belgium	27 FtM 35 MtF Diagnosis: NR 26.9 years FtM 37.8 years MtF (pre-GCGS)	CHT 100% GCGS 100%	Single centre (Gender clinic) Retrospective	Pre- vs post-GCGS Normative	4.1 years MtF 7.6 years FtM	42%	UGDS SCL-90	Cross-sectional pretreatment: SCL-90 as normative data Differences pre-/post-treatment: Fewer psychological problems post-treatment. Gender dysphoria absence post-treatment. Suicide attempt drop from 29.3% to 5.1% Predictors: Younger when applying for GCGS and attractive better outcome.
Udeze et al. (2008) UK	40 MtF DSM-IV 47.3 years	CHT NR GCGS 100%	Single centre (Gender clinic) Prospective	Pre- vs post-GCGS	0.5 years post-GCGS	NR	SCL-90R Psychiatric clinical interview for ICD-10	Cross-sectional pre-treatment: no psychiatric diagnosis Differences pre-/post-treatment: No differences in SCL-90R scores Limitation: scores of SCL-90 low already at pretreatment
	14 FtM 18 MtF	CHT 88% GCGS 100%	Multicentre (2 gender clinics)	Pre- vs post-GCGS	9 years post-GCGS	30%	Psychiatric symptoms	Cross-sectional pretreatment: 30–50% insomnia, depression or

(continued)

Table 2. Continued

Authors (year) Country	Number of trans participants/ diagnosis/ mean age at assessment	Treatment status: (on CHT or post GCGS)	Study design	Comparative groups	Length of follow-up post-treatment	Lost to follow-up	Outcome measure	Results
Johansson et al. (2010) Sweden	ICD-10 27.8 years FtM 37.3 years MtF		Prospective				Global outcome patient and clinician	anxiety. 7.1% received ongoing psychiatric treatment. Differences pre-/post-treatment: Global clinician outcome: Improved 62% Unchanged 24%. Global patient outcome: Improved 95% Worse 5%. Gender: no differences Age of onset: no differences
Pimenoff & Pfäfflin (2011) Finland	17 FtM 15 MtF Diagnosis NR 37.5 years FtM 44.4 years MtF	CHT 100% GCGS 100%	Single centre (Gender clinic) Retrospective	Pre- vs post-GCGS	5 years post-GCGS	16.2%	University of Minnesota Questionnaire	Differences pre-/post-treatment: Psychological and social functioning improved significantly Gender: No differences except for vocational functioning which was better for FtM
Colizzi et al. (2013)* Italy	25 FtM 45 MtF DSM-IV-TR 26.7 years FtM 29.2 years MtF	CHT 100% GCGS 0%	Single centre (Gender clinic) Prospective	Pre- vs post-CHT	1 year post-CHT	0	PSS	Differences pre-/post-treatment: Perceived stress lower post-treatment and as per normative data
Colizzi et al. (2014)* Italy	29 FtM 78 MtF DSM-IV-TR 26.7 years FtM 29.2 years MtF	CHT 100% GCGS NR	Single centre (Gender clinic) Prospective	Pre- vs post-CHT Normative	1 year post-CHT	0	SCID-1 SAS SDS SCL-90R	Cross-sectional pre-treatment: SAS above normal range SDS and SCL-90R in normal range except anxiety subscale Differences pre-post treatment: SAS, SDS, SCL-90R scores lower post CHT
Heylens et al. (2014b) Belgium	11FtM 46 MtF DSM-IV-TR NR	CHT 100% GCGS 81%	Single centre (Gender clinic) Prospective	Pre- vs post-CHT (47) vs post-GCGS (42) Normative	3–6 months post-CHT 1–12 months post-GCGS	7.5–26.3%	SCL-90 Psychosocial questionnaire	Cross-sectional pretreatment: SCL-90 worse than normative data Differences pre-/post-treatment: Post treatment SCL-90 as normative data 95% better mood 93% happier 81% less anxious 79% more self confidence 98% better body relation Less drugs and alcohol abuse
Ruppin & Pfäfflin (2015) Germany	36 MtF 35 MtF ICD-10 14.1 years FtM 13.7 years MtF	CHT 100% GCGS 97.1%	Single centre (Gender clinic) Retrospective	Pre- vs post-treatment	13.3 years	49.3%	SCL-90R IIP FPI-R	Differences pre-/post-treatment: SCL-90R significantly better on all subscales post treatment particularly interpersonal sensitivity IIP significant lower values at follow-up

AIM, affect intensity measure; CHT, cross-sex hormonal treatment; FPI-R, Freiburg Personality Inventory; FtM, female to male subjects, trans men; GCGS, gender confirmation genital surgery; IIP, Inventory of Interpersonal Problems; MMPI-2, Minnesota Multiphasic Personality Inventory, second version; MtF, male to female subjects, trans women; NA, not applicable; NR, not reported; PSS, Perceived stress scale; SCID-I, Structured Clinical Interview for DSM-IV, Axis I disorders; SAS, Zung Self-Rating Anxiety Scale; SAQ, Short Anger Situation Questionnaire; SCL-90, Symptom Checklist-90; SCL-90R, Symptom Checklist-90 revised; SDS, Zung Self-Rating Depression Scale; UGDS, Utrecht Gender Dysphoria Scale.

*Studies using the same data.

Results

Cross-sectional studies

Psychopathology

Studies investigating prevalence rates of psychopathology range from rates that are comparable to the general population (Colizzi et al., 2014; Simon et al., 2011; Smith et al., 2005) to the trans group having worse scores than the cis controls (Auer et al., 2013; Davey et al., 2014; Heylens et al., 2014b). The prevalence and nature of psychopathology in trans women was found to be more comparable to cis women than to cis men, the former showing a two- to threefold higher occurrence of affective problems when compared with cis men (Auer et al., 2013).

Psychiatric disorders, Axis I

The Axis I diagnoses found in all the studies reviewed were mainly affective and anxiety disorders. The occurrence of severe psychiatric conditions, such as schizophrenia or bipolar disorder, was rare. Only one study looking at Axis I disorders compares a trans group with a cis control group matched for age, natal sex and new assigned sex (Dhejne et al., 2011). This study, which uses data from the national register in Sweden, focuses on trans people following gender-confirming medical interventions and found higher rates of psychiatric disorders and suicide in this group. It found, however, that there was an improvement over time, i.e. rates of psychiatric disorders and suicide became more similar to controls over time; for the period 1989–2003, there was no difference in the number of suicide attempts compared to controls.

Psychiatric disorders, Axis II

Only one study (Duisin et al., 2014) used a (non-matched) control group when assessing Axis II psychiatric disorders. This found higher rates of personality disorders in the trans group, primarily paranoid and avoidant personality disorders. The study is limited by the small number of patients studied. The rest of the studies that assessed Axis II disorders did not use control groups. The prevalence rates of Axis II disorders ranged from 4.3% (Fisher et al., 2013) to 81.4% (Mazaheri Meybodi et al., 2014b). The type of personality disorder varied from predominantly cluster B (Hepp et al., 2005; Madeddu et al., 2009; Mazaheri Meybodi et al., 2014b) to predominantly cluster C (Heylens et al., 2014a).

Risk factors for psychopathology and psychiatric disorders

The majority of the studies comparing trans women and trans men found no differences in psychiatric disorders and psychopathology between the two groups. Four studies did find psychiatric disorders and psychopathology to be more prevalent among trans women than trans men (Claes et al., 2015; Duisin et al., 2014; Gomez-Gil et al., 2009; Hoshiai et al., 2010). Conversely, Haraldsen & Dahl (2000) found that trans women scored lower on the SCL-90R test than trans men.

One study (Heylens et al., 2014a) found no differences between the age of onset and psychiatric disorders.

As found in the general psychiatric literature, two studies investigating psychopathology among trans people also found that being in a relationship was a positive factor, associated with a reduction of psychopathology (Gorin-Lazard et al., 2012; Weyers et al., 2009).

Longitudinal studies

An improvement of psychiatric morbidity and psychopathology following GCMI was seen in all of the studies except one (Udeze et al., 2008). This study found no differences between pre- and post-SCL-90R scores, which is probably due to the low levels of psychopathology as measured by the SCL-90R pretreatment. The majority of the studies found post-treatment scores on questionnaires measuring psychopathology and gender dysphoria to be similar to normative data.

Predictors for positive outcome following GCMI

Four longitudinal studies explored post-treatment outcome predictors and found better outcomes for trans men (Smith et al., 2005) and those who were young on assessment (De Cuypere et al., 2006). Two studies did not find gender or age of onset to be predictors of outcome following GCGS (Johansson et al., 2010; Pimenoff & Pfäfflin, 2011). Interestingly, one study compared patients who had been compliant with their treatment plan with those who had not, and found no differences in outcome (Pimenoff & Pfäfflin, 2011).

Discussion

The aim of this review was to explore the literature in the field of mental health/psychiatry and gender dysphoria. Overall, it was found that trans people attending transgender health-care services present with a high prevalence of psychiatric disorders and psychopathology.

The review indicates that the level of psychopathology appears to be higher in this population than in cis controls, although it cannot reach firm conclusions as to whether the rate of psychiatric disorders is higher in trans people than in controls, due to the lack of well-matched controlled studies exploring psychiatric disorders.

The only study using a robust methodology concludes that trans people present with higher levels of psychiatric disorders post-GCMI than cis controls. However, this study looks at trans people who were treated in some cases more than 20 years ago, when society and interventions may have been very different. Studies investigating the outcome of trans people who transitioned a long time ago will be very different from those looking at individuals who transitioned in the 21st century, and although this study offers longer follow-up data, these will be affected by changes in the levels of transphobia and discrimination over time. Furthermore, surgical results were less good at that time, which is also known to affect transgender health negatively (Bauer et al., 2015; Lawrence & Zucker, 2012).

The studies reviewed in this paper include trans people at different stages of transition within the same cohort, which is confusing, and does not allow for clear conclusions to be drawn as to the levels of psychopathology and psychiatric disorders in non-treated trans people. Only one study (Heylens et al., 2014a) provides clear information regarding the rates of psychiatric disorders pretreatment. It found that, at the time of assessment and before treatment was commenced, 38% of those attending transgender health-care services presented with an Axis I diagnosis, and 15% with an Axis II diagnosis.

As all of the studies use data collected at the time of assessment at a transgender health-care service, the results regarding levels of psychopathology and psychiatric disorders cannot be generalized to trans people not in contact with clinical services. In order to clarify whether there is a difference between these groups it may be interesting to look at studies exploring lifetime psychiatric disorders. Four studies provide this information (Bandini et al., 2011; Gomez-Gil et al., 2009; Hepp et al., 2005; Heylens et al., 2014a). Of particular importance is the study by Heylens et al. (2014a), which showed clear differences between current (38%) and lifetime (70%) levels of psychiatric disorders. This shows that the rate and severity of psychiatric disorders and psychopathology may be underrepresented if data is taken only from trans people at the time they are being assessed at transgender health services; the rate may be considerably higher in those who are not on a pathway towards treatment.

The majority of the psychiatric problems detailed in the studies relate to affective disorders such as depression and anxiety. Major psychiatric problems (e.g. schizophrenia and bipolar disorder) were not found any more frequently in trans people than in the general population. Dissociative disorders were only evaluated in one study (Colizzi et al., 2015).

The results with respect to gender differences in both pre- and post-treatment cross-sectional studies were contradictory. The majority of the studies showed no differences between the genders, but, except for one study (Haraldsen & Dahl, 2000) those studies that did identify differences found that trans women were more prone to develop psychological/psychiatric problems than trans men (Colton-Meier et al., 2013; De Cuypere et al., 1995; Landén et al., 1998; Lothstein, 1984). This finding could indicate that trans women show a psychological and vulnerability profile for the development of affective disorders that resembles that of natal women (Auer et al., 2013). Biologically, this could be explained by recent findings using neuro-imaging that reveal that non-treated trans women have cerebral cortical thickness similar to cis women (Zubiaurre-Elorza et al., 2012). However, the increased levels of psychiatric disorders in trans women could also be explained by the higher risk of stigma and discrimination within this group; this may contribute to the interpersonal problems that one study found made trans women more hypersensitive to rejection (Davey et al., 2015; Simon et al., 2011).

The fact that some studies that included trans people who had been treated with GCMI found higher levels of psychopathology and psychiatric disorders (Dhejne et al., 2011) than cis controls cannot be used as evidence for the efficacy (or otherwise) of GCMI. Studies that compared different cohorts of patients (pre CHT/GCGS versus post CHT/GCGS) are only helpful in this regard when they are well controlled for psychopathology and for known factors affecting psychopathology, between both groups (Gomez-Gil et al., 2012; Gorin-Lazard et al., 2013; Fisher et al., 2014).

The effect that gender-confirming medical interventions have in improving mental health can only be concluded from longitudinal studies. This review found that longitudinal studies investigating the same cohort of trans people pre- and post-interventions showed an overall improvement in psychopathology and psychiatric disorders post-treatment. In fact, the findings from most studies showed that the scores of trans people following GCMI were similar to those of the general population. Although this is likely to be a response to the gender-confirming treatment itself, i.e. the sense of

the body being more aligned to the person's experienced gender, it cannot be ruled out that it relates instead or as well to the benefits that accrue from being validated and accepted for treatment (Nuttbrock et al., 2011). In order to help clarify this it is important to look at follow-up studies that assess trans people a relatively long time after treatment. Five studies (De Cuypere et al., 2006; Johansson et al., 2010; Pimenoff & Pfäfflin, 2011; Ruppin & Pfäfflin, 2015; Smith et al., 2001) that followed trans people for more than 2 years (maximum 13.3 years) post-treatment showed encouraging results that point towards the benefits of treating trans people with GCMI.

Although it was not the main aim of this review, we also explored risk factors for psychiatric disorders among the trans population. Victimization (social stigma, discrimination, transphobia, sexual abuse, gender abuse), difficulties accessing health care and social services, gender (as explained above) and interpersonal problems were all found to put trans people at risk of developing psychiatric disorders, particularly depression. Trans individuals were also found to receive, or perceived themselves to receive, less social support from their family and friends than non-trans siblings and matched general population (Davey et al., 2014; Factor & Rothblum, 2007; Gooren et al., 2015; Kim et al., 2006; Simon et al., 2011). Social and parental support, completed medical transition, and disclosure of transgender identity were all protective factors (Bandini et al., 2011; Bauer et al., 2015; Bazargan & Galvan, 2012; Bockting et al., 2013; Clements-Nolle et al., 2006; Davey et al., 2015; Gehring & Knudson, 2005; Gooren et al., 2015; Lombardi et al., 2001; Nuttbrock et al., 2011, 2014; Rotondi, 2011).

Quality of the studies

Almost all of the studies reviewed showed selection bias. Since most included only individuals attending transgender health-care services, the results are not generalizable to the overall trans population. Many studies are also limited by the inclusion of trans people at different stages of treatment. Longitudinal studies are also limited by lost-to-follow-up data and short follow-up time; only registry-based studies do not have lost-to-follow-up data, but their cross-sectional design fails to measure improvement of psychopathology within the same individual following GCMI. Furthermore, they are limited by the lack of matching according to known risk factors for psychiatric disorders and psychopathology within the general population (Dhejne et al., 2011).

Implications for future research

Although the studies measuring the prevalence of psychiatric disorders in trans people attending clinical services are robust and reach firm conclusions, future studies could explore the rates among those trans people not attending clinical services. Future studies could also benefit from more detailed and better controlled longitudinal studies. Due to the low prevalence of trans individuals attending clinical services (Arcelus et al., 2015), larger cohort multicentre studies such as the European Network Initiative of Gender Incongruence (ENIGI) project (Kreukels et al., 2012) may strengthen recruitment rates. Studies such as this may be limited by several factors including the variability of the interventions provided and the levels of discrimination and transphobia in different countries.

Although psychiatric morbidity should be studied as a secondary outcome of gender-confirming medical interventions, studies should primarily explore the role of those interventions in reducing gender dysphoria. A robust measure is needed to relate the primary outcome for GCMI to gender dysphoria. The variability of tools to measure gender and body dysphoria does not allow firm conclusions to be drawn, and this suggests the need for a stronger measurement tool.

In summary, this review indicates that, although the levels of psychopathology and psychiatric disorders of trans people attending transgender health-care services are higher than the cis population at the time of assessment, they do improve following gender-confirming medical intervention, in many cases reaching normative values. Information on trans people not in contact with services is lacking. While gender-confirming medical intervention improves mental health, trans people are still a vulnerable group.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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